NOVEMBER 22, 1954 NEWS ISSUE

Electrical World

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EBO

These three letters stand for Electrical Business Outlook, a bi-weekly service which analyzes the effect of economic and business trends on the electrical industry

THIS WEEK— the latest spurt in housing . . . page 66

- *Philadelphia Electric's disaster plan proves its effectiveness . . . page 16*
- *Plug-in bus duct saves money for Florida Power Corp . . . page 30*

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UNIVERSITY MICROFILMS IN
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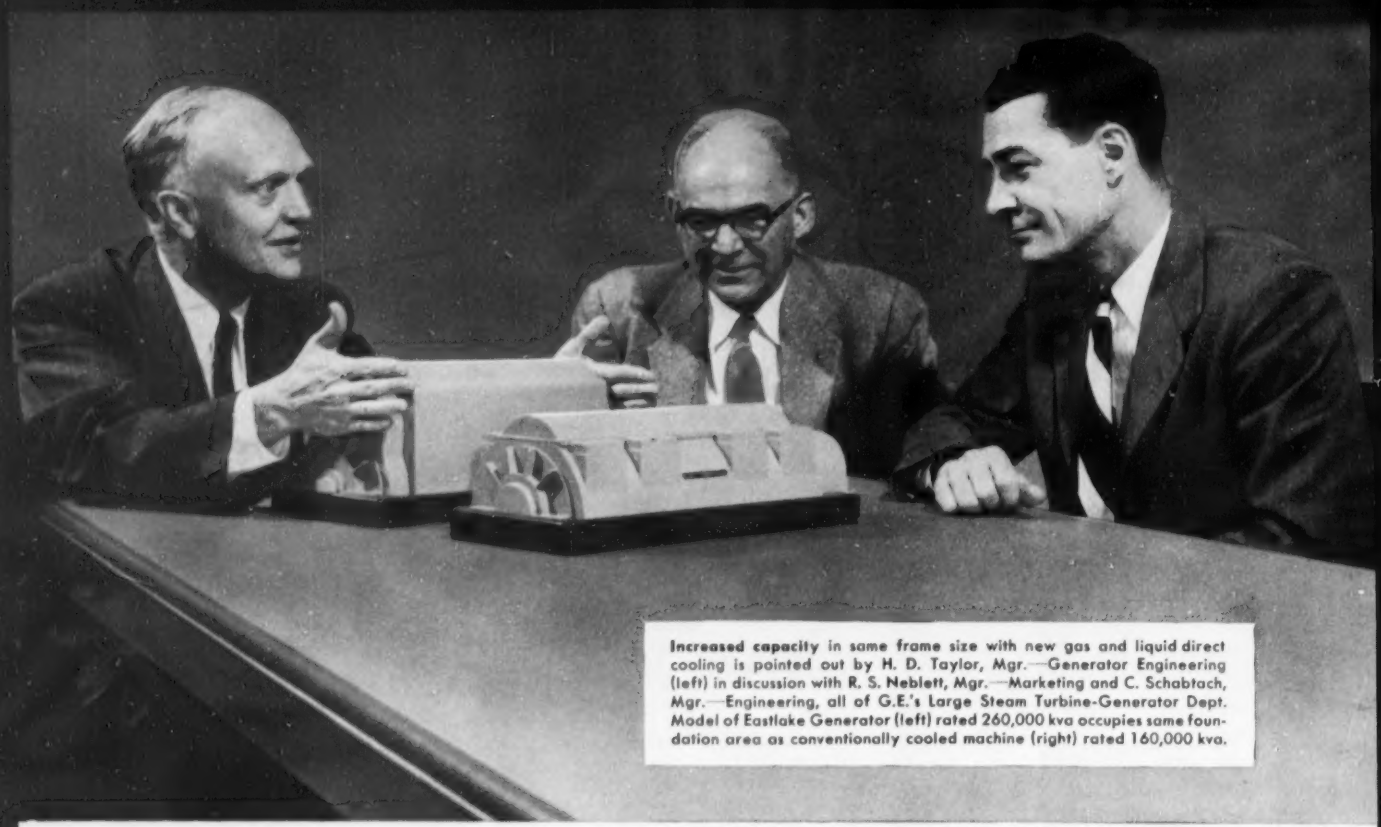
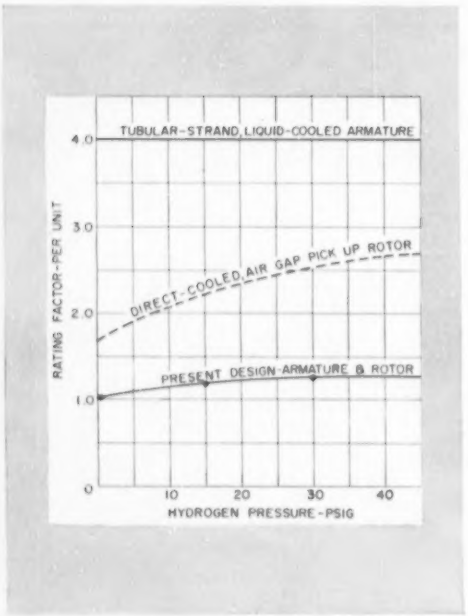


Increased capacity in same frame size with new gas and liquid direct cooling is pointed out by H. D. Taylor, Mgr.—Generator Engineering (left) in discussion with R. S. Neblett, Mgr.—Marketing and C. Schabtach, Mgr.—Engineering, all of G.E.'s Large Steam Turbine-Generator Dept. Model of Eastlake Generator (left) rated 260,000 kva occupies same foundation area as conventionally cooled machine (right) rated 160,000 kva.

New cooling advance doubles generator capacity

Eastlake Station unit points way to increased ratings through direct cooling



Higher capacity possible with new G-E direct cooling developments are illustrated in these typical rating factors (1.0 equals 100% rating) for various types of armature and field cooling. These are based on thermal limits for 3600-rpm machines.

Generators of 350,000 to 400,000 kva capacity—and even larger—have become practicable through General Electric's contributions to progress in generator design. New turbine-generators will be able to deliver up to twice present output without appreciable increase in physical size.

DIRECT COOLING ADVANCES

General Electric's combination direct cooling—using gas for the rotor and liquid for the stator—makes possible greatly advanced turbine-generators. Two units employing this new cooling technique are now under construction for delivery in 1955; one rated 260,000 kva, 3600-rpm with 8340 amperes armature current, for Cleveland Electric Illuminating Company's Eastlake Station, and a similar unit for a large eastern utility.

In addition to being the only company offering this unique cooling technique, G.E. supplies conventionally cooled units up to 224,000 kva. Thus G.E. is able to furnish a turbine-generator employing either direct or conventional cooling to best suit conditions. In this way the electric utility companies obtain generating equipment of the most economical and efficient type for every set of requirements.

NEED FOR MORE POWER

Expansion of utility loads has created the economic need for larger blocks of power. Through advances, such as G.E.'s combination direct cooling, the utility industry can now obtain these larger blocks of power with economically and conservatively designed generators.

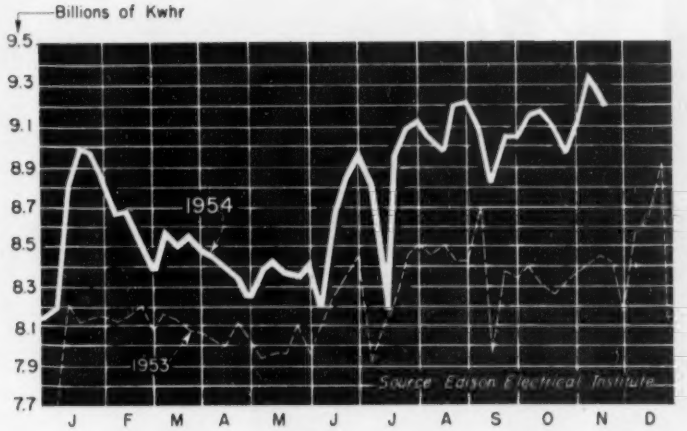
For information about the newest and most effective cooling techniques for turbine-generators write for GER-740A, "Progress in the Design and Application of Large Steam Turbine-driven Generators" to General Electric Company, Section 301-252, Schenectady 5, N. Y.

MORE POWER TO AMERICA

GENERAL ELECTRIC

Electrical World

Vol 142 No 21 November 22, 1954



Output Week Ended Nov. 13—9,197,000,000 Kwhr

Per Cent Change from Previous Year

	Total US	New Eng.	Mid. Atlan.	Cent. Ind.	West Cent.	South-east	South Cent.	Rocky Mount.	Pacific NW	Pacific SW
Nov. 13	+8.7	+1.4	+2.5	+4.8	+2.3	+19.1	+11.5	+5.3	+6.6	+7.5
Nov. 6	+11.4	+2.5	+6.1	+7.5	+5.9	+24.2	+11.2	+4.9	+7.3	+8.0
Oct. 30	+9.4	+0.9	+3.2	+3.9	+5.6	+20.4	+14.3	+4.3	+8.2	+8.9

Seasonally Adjusted Index† 172.8 Week Ago 177.1 Year Ago 159.1

Electric Power Statistics

		Latest Month	Preceding Month	Year Ago
Peak Load ‡(Million Kw)	Sept.	79.4	79.7	74.4
Capacity (Million Kw)	Sept.	99.16	98.08	87.59
Production (Billion Kwhr)	Sept.	39.55	41.17	37.03
Hydro	Sept.	7.80	8.34	7.59
Fuel	Sept.	31.74	32.82	29.44
Fuel Consumption:				
Coal (Million Tons)	Aug.	9.83	9.40	9.71
Oil (Million Barrels)	Aug.	4.85	4.45	6.54
Gas (Billion Cu Ft)	Aug.	130.49	127.37	112.88
Sales (Billion Kwhr)	Aug.	33.88	32.99	32.82
Residential	Aug.	9.65	9.50	8.48
Commercial	Aug.	6.66	6.52	5.98
Industrial	Aug.	14.89	14.35	15.8
Other	Aug.	2.68	2.62	2.52
Net Income Class A & B Companies ($ Million)	Aug.	89.43	84.44	77.24
Estimated Dec. '54 Peak ‡(Million Kw)	Aug.	88.0	88.1	91.9
Kwhr per Residential Customer (12 Month Average)	Aug.	2,476	2,458	2,287
Revenue per Kwhr Residential Service (12 Month Average)	Aug.	2.71¢	2.71¢	2.75¢
Canadian Production (Billion Kwhr)	Aug.	5.46	5.48	5.09

Business Statistics

FRB Industrial Production Index†	Sept.	126	124	135
Gross National Product Annual Rate ($ Billion)	3rd Qtr.	355.5	356.0	367.2
EW 4 Industry Production Index†	Sept.	117.0	115.4	124.9
ENR Construction Cost Index††	Oct.	134.6	134.3	128.0
BLS Consumer's Price Index	Sept.	114.7	115.0	115.2
NEMA Insulation Materials Sales Index†	Sept.	123	111	153
NEMA Electric Appliance Sales Index†	Sept.	115	91	102
NEMA Household Refrig. Sales Index†	Sept.	73	71	62

*Preliminary **Revised ‡Class 1 Systems †1947-49=100 ††1949=100

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ELECTRICAL WORLD

Published weekly by McGraw-Hill Publishing Company, Inc.; James H. McGraw (1860-1948), Founder. Publication Office, 99-129 N. Broadway, Albany 1, N. Y. Executive, Editorial and Advertising Office, McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y. Donald C. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Electrical World—Subscription Service, 99-129 North Broadway, Albany 1, N. Y. or 330 W. 42nd St., New York 36, N. Y. Allow one month for change of address.

Subscriptions are accepted only from executive, supervisory, and engineering personnel in electric utilities, manufacturing companies, and related fields. Position and company connection must be indicated on subscription orders.

Single copies 35¢. For the United States and possessions $6 a year, $9 for two years, $12 for three years. Canada, $7 for one year, $11 for two years, $14 for three years, (Canadian money, at par.) Other Western Hemisphere, and the Philippines, $15 for one year, $25 for two years, $30 for three years. All other countries $25 for one year, $40 for two years, $50 for three years. Entered as second-class matter, November 16, 1936, at the Post Office at Albany, N. Y., under the Act of March 3, 1879. Printed in U.S.A.

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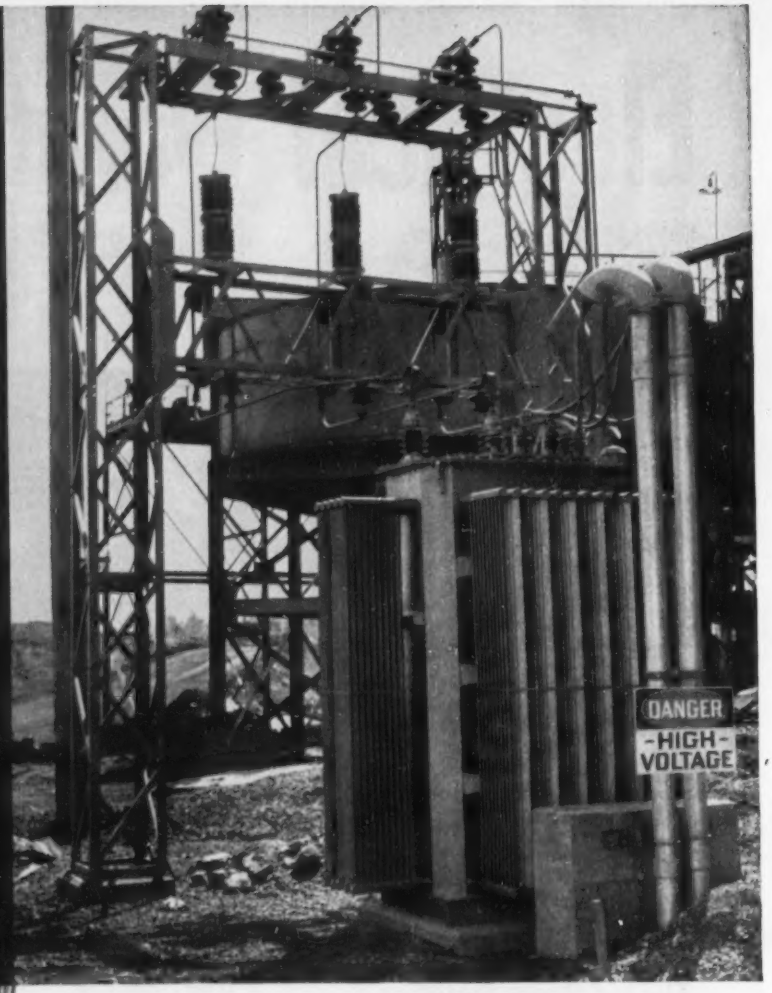

Taconite is an important word in the Mesabi Iron Country. As the supply of rich ore becomes scarcer, the mining companies are prepared to process taconite and lower grade iron ore for delivery to the nation's steel mills.

Processing taconite is a man-sized job. It is one of the world's hardest ores. It has to be crushed and ground to separate the iron particles from the rock and silica.

During the winter, the temperature in the Mesabi country often drops to 30° below zero. Tough jobs under operating conditions like this call for a plentiful supply of really dependable power. At the Nashwauk, Minnesota, mine of The Cleveland-Cliffs Iron Company, this power is delivered by Wagner Transformers. Shown above is the 3000 kva Wagner Power Transformer that furnishes power for this plant, and at the left is one of the Wagner 1000 kva Unit Substation Transformers that supply plant loads.

Wagner can also furnish motors especially designed for use in taconite plants. Your nearby Wagner engineer can help you select the right transformers or motors for *your* needs. Call the nearest of our 32 branch offices, or write us.

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T54-12

THE ELECTRICAL WEEK

The Issue's News Highlights . . . Joint Atomic Energy Committee approval clears way for construction of Dixon-Yates plant . . . President explains position.

Electric industry leaders gathering at Nema convention foresee multi-billion dollar market growth.

Summer peak problems are discussed at Southeastern-Electric Exchange sales conference.

Investment in electric companies' securities continues at a high level this year.

Washington State Power Commission and Grant County PUD "shake hands" in formally approved "memorandum of understanding" but prepare for battle in State Supreme Court in late January over construction of Priest Rapids Dam. As matters now stand, PUD may proceed with engineering and other studies of $325-million project under preliminary FPC permit. The court action will seek to eliminate the commission as a contender to build the dam.

Solar energy may not precede nuclear energy in widespread commercial use but, Dr R. G. Gustavson, president of Resources of the Future, Inc, believes it will come "much earlier than some of us had thought." He recently told National Reclamation Association "solar engines may be pumping irrigation water where fuel is scarce . . . as electrical generating capacity is built up to cope with peak loads for air conditioning in homes and industry." Heat pumps might be supplemented by solar energy to heat homes, he continued.

Indianapolis P&L takes constructive step to encourage development of all-electric home. Firm has filed with PSC a new rate schedule which would allow customers up to 2,500 kwhr per month for house-heating at 1.7¢ per kwhr compared with 2¢ on regular residential rate. Rate is optional; would be effective Nov. 1 for trial period of 18 months; is available to residential users where electricity is sole primary method of space heating.

Large power load from compression distillation of ocean water for drinking purposes will come in next ten years, predicts S. M. Vance, Apparatus Sales Division, General Electric . . . Appalachian Electric Power acquires lands and rights at Smith Mountain Dam site on Roanoke River from Roanoke-Staunton River Power which was recently liquidated . . . U. S. Supreme Court declines to rule on validity of FPC license to Winter EL&P (Wis.) to build hydro dam on East Fork of Chippewa River in Sawyer County . . . EEI Industrial Relations Committee-sponsored Annual Round Table Conference is scheduled for Drake Hotel, Chicago, Sept. 19-21, 1955, according to Thomas Ayers, vp, Commonwealth Edison and conference subcommitee chairman.

Detroit Edison orders 300,000-kw turbo-generator from Allis-Chalmers for River Rouge No. 3. Foster-Wheeler will supply 2-million lb per hr boiler to operate at 2,450 psi/1,050 F/reheat 1,000 F. High-pressure unit will have 3,600-rpm generator forced-cooled with hydrogen; low-pressure unit will be conventional 1,800-rpm; combined rating is 375,000 kva. Predicted plant heat rate is 8,750 Btu/kwhr.

Off the Washington Wire . . . Outlook for AEC-TVA agreement on follow-up contract to implement Dixon-Yates contract is still uncertain. But chances are now considered favorable for agreement in some form.

TVA figures that, with additions now in progress, it can keep pace with load growth of 500,000 kw a year until 1956. Present schedule calls for installation of 9.5 million kw by end of 1956.

Partnership philosophy is exemplified by offer of Portland GE, Pacific P&L, and Washington WP to advance $350,000 of planning funds to Army Corps of Engineers for the John Day Dam. Aim is to get preliminary design and exploration work under way during low water winter months immediately at hand. If Congress later appropriates funds for dam, firms would be reimbursed. But firms expect no interest on money and realize project may never be built.

When St. Lawrence River Power becomes available, Massachusetts utilities will be negotiating directly with their State Department of Public Utilities on power purchases. Under terms of a bill filed for consideration by 1955 Massachusetts Legislature, the department would be empowered to negotiate with New York State Power Authority for the St. Lawrence River power and would resell it to private and municipal companies.

Merger talk is in the air as New England Power and Connecticut River Power, subsidiaries of New England Electric System, announce plans to consolidate . . . Joint merger agreement for Pennsylvania P&L and Scranton Electric will be voted on by stockholders at special meetings of both firms Dec. 15.

Mississippi Valley Generating Co files declaration of intent with SEC to issue 55,000 common shares at $100 par value. Middle South Utilities will buy 43,450 and Southern Co, 11,550 shares.

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W. Sterling Cole (with hand to forehead) announces Joint Atomic Energy Committee's decision granting waiver, giving . . .

Go-Ahead Signal for Dixon-Yates Plant

The Dixon-Yates contract to supply the Atomic Energy Commission with 4-mill private power has been signed, sealed, and all but delivered.

In rapid-fire sequence, AEC modified its agreement with the Dixon-Yates company, the two parties signed the contract, and the Joint Committee on Atomic Energy granted approval of the arrangement.

This means Mississippi Valley Generating Co, the power firm organized in Arkansas by Edgar Dixon, president, Middle South Utilities, Inc, and E. A. Yates, board chairman of Southern Co, can get on with the job of choosing a construction firm to build its new 650,000-kw steam plant at West Memphis, Ark. Ebasco Services, Inc, is slated to perform architect-engineer work.

The contract still faces two tests:

- Approval of financing by Securities and Exchange Commission.
- Continued Democratic attacks.

Both Southern Co and Middle South are utility holding companies, subject to the restrictions of the Public Utility Holding Company Act of 1935. Only twice since passage of the Holding Company Act has SEC permitted two or more holding companies, or their subsidiaries, to join in financing a jointly owned and controlled operating electric utility company. In both these cases—Electric Energy, Inc, and Ohio Valley Electric Corp—electric generating plants to supply the AEC directly with power were involved.

The Democratic Congress which meets Jan. 5 will present the signatories to the Dixon-Yates contract with a constant headache.

Rep Chet Holifield (D-Calif.) announced he will introduce legislation the first day of the new session aimed at ordering cancellation of the contract, will join an effort to cut off funds from use in paying AEC's obligations under the contract.

Vote by the Joint Committee approving AEC's request to waive a required 30-day waiting period was on a straight party-line basis—10-8.

In the signed version of the contract, both AEC and MVGC have a chance to back out of the arrangement without cost if SEC does not approve financing before Feb. 15.

As signed, contract provides:

- That MVGC build a steam plant on the west bank of the Mississippi River containing three 217-Mw generating units capable of producing 5.2 billion kwhr a year at 98% load factor, the planned rate. AEC is obligated to take, and the company obligated to supply, 600,000 kw at all times, with an agreement that MVGC may channel the 50,000-kw excess capacity of the plant into the affiliated systems of Middle South and Southern Co in return for back-up power when units are down. Cost of the plant and related facilities is estimated at $107,250,000. Dixon-Yates transmission lines will connect with the TVA system in mid-river.
- Company earnings for the life of the 25-year contract are limited by agreement to $600,000 a year on the $5.5 million equity capital invested.
- Price to AEC for permanent power is based on a demand charge of $1.257 kw a month and a 1.741 mills-per-kwhr demand charge at 98% load factor. An energy charge of 1.863 mills per kwhr is provided at a base price of 19¢ per million Btu fuel cost, and there is provision for a .285-mill-per-kwhr reimbursement of state and local taxes. The base charge is 3.989 mills per kwhr. Estimated annual power cost at 98% load factor is $20,746,800.
- AEC is given the right to recapture the plant at any time within three years of the signing of the contract.
- In event of AEC cancellation during the life of the contract, three-year notice must be given. The company then absorbs 100,000 kw a year until the entire 600,000 kw contracted for has been channeled elsewhere during the succeeding six years.
- AEC reimburses cost of replacements up to ¼ of 1% annually of plant cost on a cumulative basis. Replacements costing more than $100,000 must have AEC approval.

As of last week, a supplementary contract between AEC and TVA had not been agreed on.

President Explains His Policy

Following is the text of a letter on the Dixon-Yates contract from President Eisenhower to Rep W. Sterling Cole, New York Republican and chairman of the Senate-House Atomic Energy Committee. (EW editors have put key paragraphs in heavy type):

Dear Stub:

On several occasions you and I have discussed the Administration plan to relieve T. V. A. of part of its obligation to furnish electric power to A. E. C. in order that T. V. A., without additional steam plants built at taxpayers' expense, may have an adequate supply of electric power for its customers through 1957.

My general thinking on the subject is this: It seems to me that all arguments for the construction by the Federal Government of the additional steam plants ignore this one and very important truth: if the Federal Government assumes responsibility in perpetuity for providing the T. V. A. area with all the power it can accept, generated by any means whatsoever, it has a similar responsibility with respect to every other area and region and corner of the United States of America.

Logically, every section of the United States should have the same opportunities, and the Federal Government should not discriminate between the several regions in helping to provide this type of facility. My own conviction is that we have not been alert enough in making certain of this equality of treatment. If this is the case, then it is high time that other regions were getting the same opportunities.

I cannot believe that Americans, in general, disapprove of attempting to place all regions on a basis of equality in this regard. Consequently, there must either be some re-examination of any plans which would call for the Federal Government to supply all the additional power capacity that might be needed in the future in the Tennessee Valley, or logically we would have to begin plans for a gigantic power development to cover the entire nation equitably.

The directive to the A. E. C. to make arrangements for the purchase of private power—either directly or by finding a new private source to replace available T. V. A. power—was designed to allow time for a thorough examination of this whole vast field, without hurting the citizens of the valley.

As a consequence of these facts, I believe that the project for building new plants at Federal expense—implying a purpose of continuing this process indefinitely in the future—is therefore wholly indefensible unless it should become part of a vast national plan. If this is to be national policy, it is most certainly a project that demands earnest and prayerful study. In the meantime, the citizens of that region will not be deprived of the additional power they need for the next several years.

It seems to me that there has been a very great deal of talk and argument—much of it partisan—about issues that are really clear and simple. No one in this Administration has any intention of destroying or damaging T. V. A. or of diminishing its effectiveness in any way. But this is not the same thing as fastening on the Federal Government a continuing and never-ending responsibility which I frankly do not believe is logical nor, in the long run, in the best interests of the country.

The Administration plan, and all facts concerning its development, have been before the public for months. I hope that the Joint Atomic Energy Committee will give the plan, and the proposed contract to carry it into effect, the fullest consideration that the committee deems necessary. If, however, after such consideration, the committee is of the opinion that the final contract terms are completely satisfactory, it would be clearly desirable and in the best interests of the people of the T. V. A. area that any additional waiting periods be waived, so that construction may begin as soon as possible and people in the T. V. A. area may make their plans for the future.

With warm personal regards,

Sincerely,

DWIGHT D. EISENHOWER.

Power Funds . . .

. . . aid reclamation, says Dexheimer; cites $50.8 million total taken in fiscal 1953-54

Power revenues from Bureau of Reclamation projects are contributing heavily to the bureau's appropriations this year, W. A. Dexheimer, Commissioner of Reclamation, recently told National Reclamation Association at its annual meeting.

The Reclamation fund is financing 51% of this year's activities, leaving less than half to be supported by the taxpayers, said Dexheimer.

Dexheimer told the meeting that at the close of last fiscal year, there were 4,718,450 kw of installed hydroelectric capacity in multipurpose dams. Revenue from the plants and some other federally built structures in the Missouri River Basin for which Reclamation markets power, returned to federal treasury $50.8 million.

McKay Cites Problems . . . Earlier, Interior Secretary Douglas McKay pointed out that while the U. S. was essentially a "have" nation in water resources, it was facing a growing problem because of improper distribution.

"We cannot carry the tremendous defense expenditures of the moment and also at the same time sponsor all of the projects for water use and control which may be desirable. It is for this reason that the President has declared himself repeatedly in favor of a partnership policy for the construction and wise use of these facilities," said McKay.

Resolutions . . . NRA adopted resolutions proposing among other things:

1. That authority to regulate and control the appropriation, distribution and use of waters of streams arising in the states lying wholly or partly west of the 98th meridian is exclusive function of the states.

2. That federal laws be amended so that "neither a state nor a state agency shall be required to secure a permit from Federal Power Commission for constructing a dam across a navigable stream, unless the presence or operation shall materially and adversely affect the navigability of the stream as found by the Defense Department . . ."

Nema Studies 5-Year Market Outlook

Multi-billion growth foreseen by industry leaders. Appliance sales to lead the way bringing new spurt in growth to be shared by all segments of industry

At the 28th annual convention of the National Electrical Manufacturers Association in Atlantic City, Nov. 8-10, leaders of the electrical industry took a long look at prospects for the next five years. They saw a multi-billion dollar market growth sparked by prospective sales of 428 million home appliances. This they predicted will create a $2-billion apparatus market just to serve the load and a $3½-billion market for supplies to wire and de-wiring homes. For utilities it means 5,000 kwhr per home per year by 1963.

These prospects, and the key roles that various industry divisions will play in it, were foretold at a dinner meeting Tuesday evening. The program was sponsored by Nema's Major Appliance Division and presented by Nema Pres J. H. Jewell as an experimental attempt to demonstrate the interdependence of the electrical industry and the need for promoting its goals to all members of Nema.

Discussions of the industry's growth and plans were keynoted by Raymond A. Rich, vice president in charge of Philco Corp's appliance division.

Speaking for the major appliance manufacturers was J. H. McKibben, Westinghouse Electric Corp vice president; for apparatus makers, W. V. O'Brien, vice president of General Electric Co; for adequate wiring, L. E. Barrett, president of Barrett Electrical Supply Co and National Adequate Wiring Bureau; for Nema plan committee chairman A. F. Metz, chairman of the board, Okonite Co; and for the electric utilities, Pres B. L. England of Atlantic City Electric Co.

428 Million Home Appliances Can Be Sold

Said McKibben on the appliance industry's future: "We'll be well on our way to (again) doubling kwhr consumption over the next 10-year span. The appliance industry can sell 428 million electric home appliances in the next five years and by 1963 there will be an average use of 5,000 kwhr per home per year.

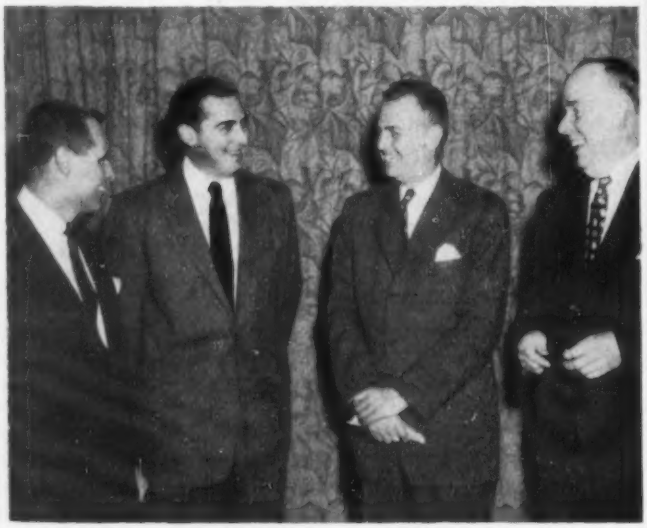
He predicted that in this time there will be an average of eight additional new electric appliances—not including replacements—sold to every home in the country.

What does this future appliance load mean to the electrical apparatus business? At least $2 billion in new sales opportunities said GE's O'Brien. "Every appliance sold adds to the need for turbine-generators, wire and cable, line material, guys, poles, power and distribution transformers, motors, controls and meters."

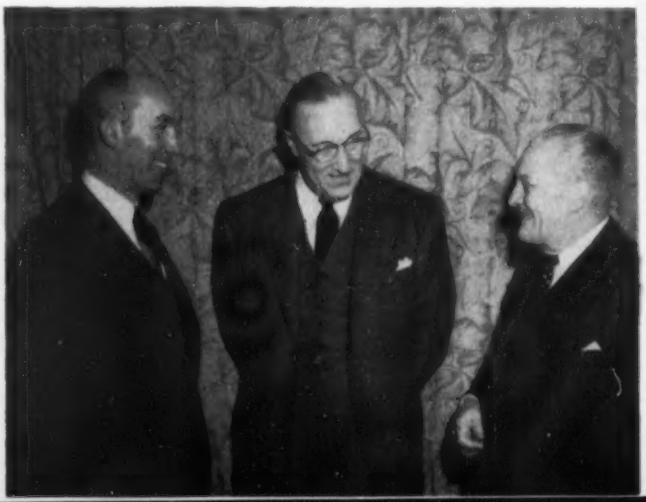
He cited the electric range as an example. "Over seven million new ones will be sold in the next five years to increase the residential load by five million kwhr. New equipment needed to serve this load alone will amount to some $321 million."

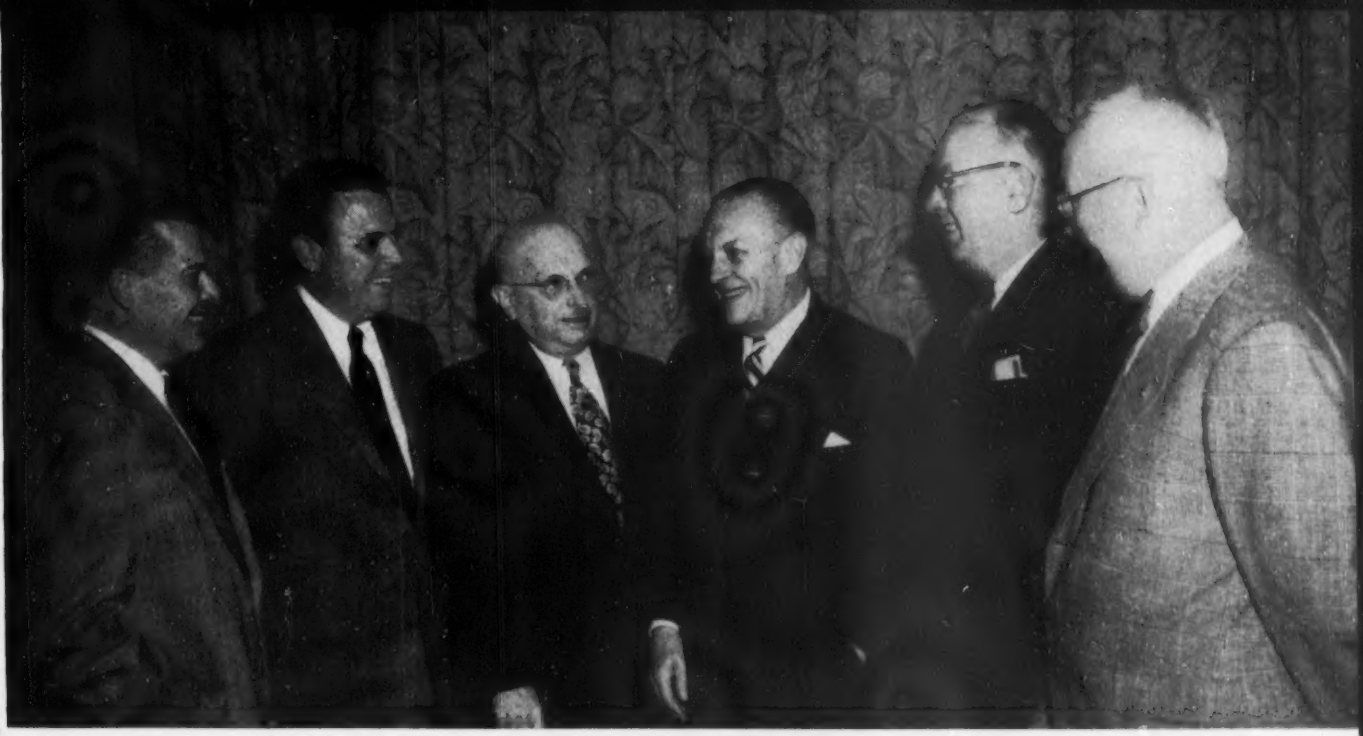
But with the optimism came a sobering thought—inadequate wiring.

"We must overcome this roadblock," said Barrett who also serves as National Association of Electrical Distributors president, "if we are to realize these potential sales forecasts." He called for a better coordination of individual companies' activities with the National Adequate Wir-



ANALYZE MARKET PROSPECTS—Above group includes: L. E. Barrett, Barrett Electrical Supply Co; R. A. Rich, Philco Corp; J. H. Jewell, Nema President and J. M. McKibbin, Westinghouse. Pictured below are: B. L. England, Atlantic City Electric Co; W. V. O'Brien, General Electric Co; and A. F. Metz, The Okonite Co





NEW NEMA OFFICERS include: Vice President B. C. Neece, Landers, Frary & Clark; Vice President J. J. Mullen, Jr, Moloney Electric Co; Treasurer A. A. Berard, Ward-Leonard Electric Co; President A. F. Metz, The Okonite Co; Vice President W. A. Elliott, Elliott Co; and Vice President F. F. Loock, Allen-Bradley Co. Vice President W. V. O'Brien, General Electric Co, is not shown

ing Bureau, a strengthening of the bureau's work and more advertising and promotional support by individual companies as ways of coping with the problem.

"Let us take adequate wiring out of the luxury stage and make it a necessity," he said. "Let us stop asking the prospective owner what he wants in wiring—he doesn't know. Let us tell him what he requires."

"And," he added, "if the industry solves the inadequate wiring problem, not only will the future of the appliance industry be assured, but manufacturers of wiring materials can cash in on an immediate market of $3½ billion."

Metz gave Nema's response by summing up the specific things the manufacturers can do. "First," he said, "let's think big. With goals such as eight additional appliances per wired home, 25 million homes to wire adequately, automation, and new concepts in lighting and air conditioning, the electrical industry must wade in on these markets aggressively. Second, let's gang up on industry problems and get behind industry-wide programs such as adequate wiring. Third, let's sell our employees on being ambassadors for our industry."

England, representing what Rich called "the industry's keystone", called for cooperative action between the electric utilities and the manufacturers. "Your future and ours are closely linked together," he said.

He pointed out that the industry goals set forth are realistic and obtainable, and that the utilities also are working to achieve them. "We are doing so because we want a well-balanced load. The residential load is our most stable one and it offers one of our best opportunities for load building. What is more, we want to electrify America the free enterprise way and make electrical living a reality.

In his address before the annual business meeting of Wednesday noon, Nema's outgoing president J. H. Jewell cited the National Adequate Wiring Program as one of the association's most important activities today. This program must be carried on by Nema members, he said, in urging increased activity in the battle against wiring inadequacy in 1955. Jewell also pointed out that standardization activities are an important function of Nema and that standards are developed as the members want them. As an indication of the interest in standards, Jewell reported that the sale of standards last year amounted to $50,000.

Taking their cues from Jewell's remarks, Nema members okayed without comment or discussion a $1,172,294 budget for 1955 which called for an increase of $25,000 in the appropriation for the National Adequate Wiring Program and $10,000 for Nema standards. The total appropriation for adequate wiring in 1955 totals $157,835 and for standards $27,057. Other notable increases in budget appropriations for 1955 were to combat secondary boycotts and for Nema's statistical service to members. Both service projects were increased by about $10,000.

Robert S. Fleshiem, assistant to the vice president, Allis Chalmers Manufacturing Co, Milwaukee, Wis., was presented with the 50-year award for a half-century of service to the electrical industry at the closing luncheon. The presentation was made by Jewell.

Also presented to the membership at the Wednesday luncheon were the 1955 panel of new Nema officers: President, A. F. Metz, chairman of the board, The Okonite Co; Vice presidents: B. C. Neece, president, Landers, Frary & Clark; Fred F. Loock, president, Allen Bradley Co; W. V. O'Brien, vice president and general manager, Apparatus and Sales Division, General Electric Co; J. J. Mullen Jr, president, Moloney Electric Co; W. A. Elliott, president, Elliott Co; and Treasurer, A. A. Berard, president, Ward Leonard Electric Co; Members of the board of governors who are members at large of the officers committee are: Hoyt Post Steele, president, Benjamin Electric Manufacturing Co and J. W. Corey, president, Reliance Electric & Engineering Co.

Hudson Valley Utilities Link Systems

Ernest R. Acker (left) and Charles L. Hulswit, presidents of Central Hudson Gas & Electric Corp and Rockland Light & Power Co, respectively, together close a high voltage switch on a new 130-ton transformer connecting the electric transmission systems of both utility companies near Chester, N. Y.

This new connection, providing for an interchange of up to 50,000 kw on an economy or emergency basis, brings Rockland L&P into an existing network linking Central Hudson, Niagara Mohawk Power Corp, and Consolidated Edison Co of N. Y.

In a joint statement the two presidents said "the new power link will bring about a greater degree of coordinated planning to meet the power supply requirements of the four systems, particularly those of Central Hudson and Rockland."

Columbia Commission OK's 7-State Compact

The Columbia Interstate Compact Commission, meeting in Portland Nov. 11, gave final approval to the seven-state compact, tentatively approved earlier in Spokane (EW, Nov. 8, p 22). This action ended four years of negotiation.

Jurisdictional conflicts will be resolved with federal agencies at a meeting in Washington the week of Dec. 13. After this the commission will prepare implementing bills for action by state legislatures of the seven states (Washington, Oregon, Idaho, Montana, Nevada, Utah, and Wyoming) and Congress.

Membership will give the four major states (Washington, Oregon, Idaho, and Montana)) two commissioners each, the federal government one non-voting member who will be chairman, and the other ratifying states would have one vote each. Eight votes would prevail, thus precluding domination by either upstream or downstream interests.

At another meeting in Portland, a day before the compact commission gathering, the Columbia Basin Inter-Agency Committee appointed a task force to plan long range Pacific Northwest power requirements.

Including at least five engineers from Bonneville Power Administration, Army Corps of Engineers, Bureau of Reclamation and the Federal Power Commission, the task force will study power requirements, perhaps beyond 1980, in hydro, steam, and nuclear energy fields. It will not duplicate work of the Northwest Governors' Power Policy Committee which is concerned with the needs of the next ten years.

NE Hydropower

Four-year study of New England, New York States reveals annual 5-million kw potential

Enormous untapped power reserves in New England are expected to foster remarkable expansion in that area's economy in the next 50 years, Col Benjamin B. Talley, chairman of New England-New York Inter-Agency Committee, has predicted.

Col Talley's forecast was based on the commitee's four-year investigation of potential hydroelectric and river basin resources of six New England states and upstate New York. The study, to consist of 40 volumes, is set upon completion to be presented to President Eisenhower June 30, 1955.

Cites Area's Latent Power . . . Col Talley, Army Corps of Engineers North Atlantic Division engineer, said combined untapped hydroelectric resources of the seven-state area, including St. Lawrence Project and redevelopment of Niagara River could exceed 5 million kw per year.

He made first public report on NENYICA's survey at meetings in Berlin, N. H., and Augusta, Maine, Nov. 9-10. These gatherings were concerned with data on these river basins: Androscoggin, Presumpscot, Saco, St. Croix, St. John, Penobscot and Kennebec, and the Maine coastal area.

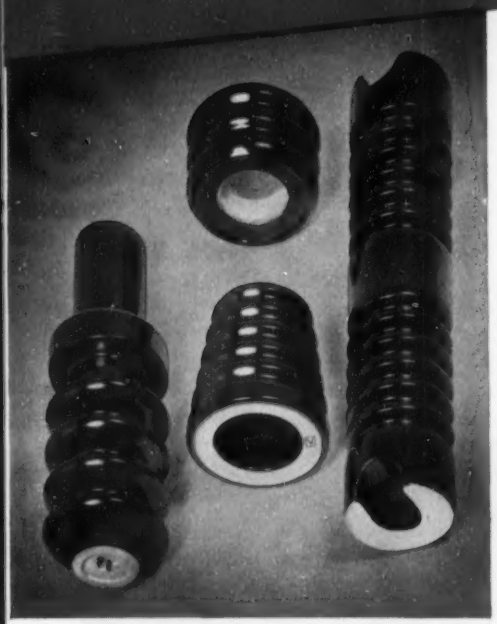
NENYIAC, which does not recommend specific construction of any project, reports that it is still too early to publicize overall cost data and kilowatt capacity now under consideration.

As study approaches completion, further hearings are being planned to be held during December at Springfield, Mass., and New Haven, Conn. Others are scheduled in New York State early in 1955.

Continuous laboratory testing and special treatment of water make possible Victor *Purified* Porcelain

Another Reason Why—

VICTOR Makes Better Insulators



Victor manufactures many special shapes in addition to a complete line of standard porcelain for transmission and distribution.

ONLY VICTOR MAKES

PURIFIED PORCELAIN

Many milestones in insulator progress have been due to VICTOR research. But none is as important as its development of *Purified* Porcelain. By specially treating the water used in the manufacture of VICTOR Insulators and employing many other ceramic advances, VICTOR gives you the finest insulator porcelain ever made—porcelain which, for the first time in the industry, is *pure* porcelain all the way through!

Purified Porcelain has vastly greater uniformity in mechanical and electrical strength values, higher mechanical impact and puncture voltage values, greater density, hardness and permanence than any other insulator porcelain. That's why more and more power men are specifying VICTOR *Purified* Porcelain Insulators.

Specify

VICTOR *PURIFIED* PORCELAIN INSULATORS

VICTOR INSULATORS, INC., VICTOR, N. Y.
SUBSIDIARY OF I-T-E CIRCUIT BREAKER CO.

Low and High Voltage Pintypes • Suspensions • Guy Strains • Spools • Switch and Bus Insulators
Custom Designed Porcelain

NORTH—Shakopee, Minnesota praised the performance of its Form 206 luminaires. The new lights provide superior illumination even in sub-zero weather.

EAST—Central Maine Power Co. accomplished their working objective of providing better street lighting economically by installing Form 206 fluorescent lights at Auburn, Maine.

NEW G-E FLUORESCENT STREET LIGHTS GAIN NATIONWIDE ACCEPTANCE

Are fluorescent street lights practical? Utility and municipal officials who have installed G-E Form 206 fluorescent luminaires are best qualified to give the answer. Their actual field experience, in all parts of the country, is summarized in the following questions and answers.

WHY USE FLUORESCENT STREET LIGHTING?

Fluorescent street lighting provides better visibility and a more even light distribution than the best engineered systems of either filament or mercury lamps. The low brightness of the light source reduces the glare and eye strain that accompanies other types of street lighting.

IS VISIBILITY IMPROVED?

Yes. Many lighting experts believe that fluorescent street lighting increases actual visibility by about one-third. Thus, a 1.25 footcandle level from a Form 206 fluorescent luminaire seems to provide the same visibility as a 1.7 footcandle level from filament or mercury luminaires.

IS THE COLOR OF THE LIGHT PLEASANT?

Yes. The whiter light furnished by the fluorescent lamps does not distort the familiar coloring of objects and people. Businessmen find that shoppers even come from outside usual trading areas to shop under the comfortable light from the fluorescent luminaires.

IS THE SIZE OF THE LUMINAIRE A PROBLEM?

No. The Form 206 luminaire is only slightly over six feet long and the distinctive size and shape add functional beauty to the appearance of any street or roadway. No guys or trusses are required to support the luminaire even in high winds.

WHAT MAINTENANCE IS REQUIRED?

Maintenance is reduced! The fluorescent lamps used in the Form 206 have an average lamp life of 7500 hours, or about two years of street-lighting operation. The hinged plastic globe is shatterproof and is tightly sealed to prevent dirt or insects entering the unit. Sun, rain, heat, cold, or aging do not adversely affect the plastic globe or the light output.

HOW DO COSTS COMPARE?

When over-all lighting costs are computed on an equivalent visibility basis, G-E Form 206 fluorescent luminaires cost less than any other comparable system of filament or color-improved mercury. Although equipment and amortization costs are somewhat higher, installation costs are comparable, and operating costs are generally lower.

GET MORE INFORMATION about this outstanding G-E fluorescent luminaire, the Form 206. Contact your nearest G-E Apparatus Sales Office, or write Section 452-139, General Electric Company, Schenectady 5, N. Y.

SOUTH—Statesville, North Carolina installed 104 Form 206 fluorescent street lights and was enthusiastic about their visual comfort, economy, and modern appearance.

WEST—Virtually glareless illumination and an even light pattern resulted when Seattle installed Form 206 luminaires to light the second level of this new Alaskan Way viaduct.

GENERAL ELECTRIC

RUBBER INSULATION—0 to 5kv

the complete story on

UNSHIELDED POWER and CONTROL CABLE

Here's the complete story on unshielded Okolite-Okoprene power and control cable. Under one cover in Okonite's new 128 page Bulletin EW-1085 you will find:

1. CONSTRUCTION FEATURES
Okoloy conductor coating, Okolite insulation, Okoprene sheath, Okonite's exclusive strip-insulating process, why 5kv unshielded cables are best.

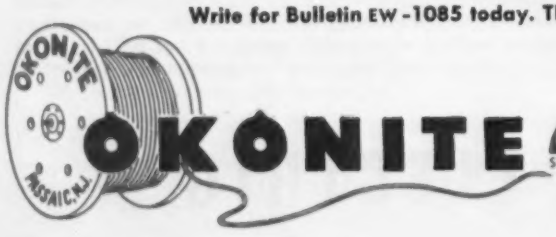
2. ENGINEERING INFORMATION
electrical formulas, current-carrying capacities, resistance ratios, voltage regulation, short circuit currents, complete dimensional data for aerial, duct, and direct burial constructions.

3. INSTALLATION AND HANDLING TECHNIQUES
conduit and direct burial installation, proof-testing after installation, periodical maintenance tests.

4. SPLICING AND TERMINATING
drawings and instructions for straight and tee splices, indoor and outdoor terminals, splices to paper and varnished cambric cables.

If you need a cable for 4160 volt operation, remember Okonite can supply it *unshielded* . . . assuring reduced installation costs as well as easier splicing and terminating. Okolite-Okoprene does *not* have to be shielded at 5kv because the Okoprene sheath is highly resistant to corona cutting and has high surface resistivity. This limits the magnitude of longitudinal drainage currents which can flow to ground at a contact point, thereby preventing cable burning.

Write for Bulletin EW-1085 today. The Okonite Company, Passaic, New Jersey



OKONITE OKONITE SINCE 1878 ***insulated cables***

2753

Roanoke Project, Once Storm Center, Making Rapid Construction Progress

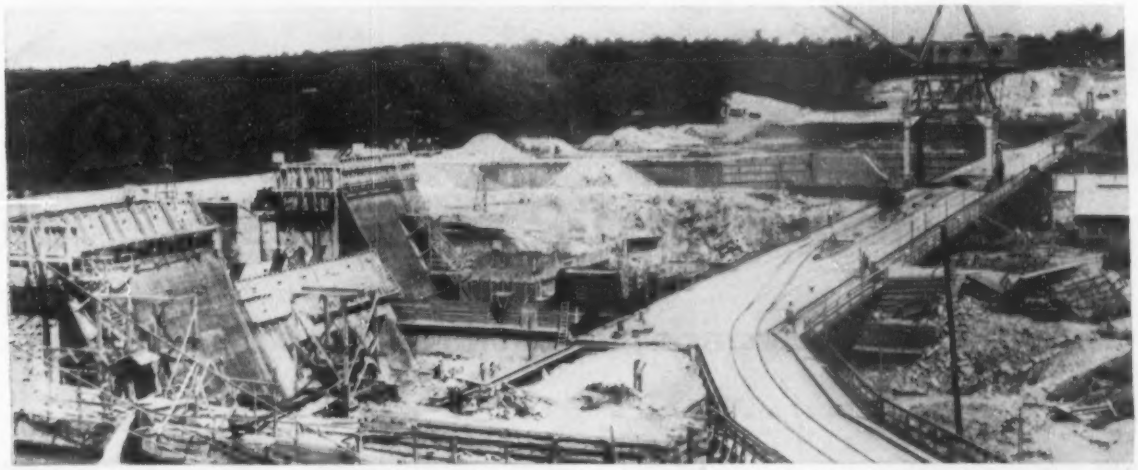
OBSERVATION TOWER overlooking Roanoke River project was constructed by Vepco for "sidewalk superintendents"

Construction of Virginia Electric & Power Co's $34-million, 100,000-kw hydroelectric project at Roanoke Rapids, N. C., is moving at a swift pace. Concrete pouring on the powerhouse and the 3,000-ft long dam has reached the midway point. And gouging out of an 8,000-ft tailrace is 70% complete.

The power project is being built by Stone & Weber Engineering Corp. It was the center of a long and bitter dispute between public and private power interests. The Supreme Court ultimately ruled in favor of private development of the site.

The tailrace is being cut from solid rock to a maximum depth of 56 ft and minimum of 31 ft. The channel will be 80 ft wide. The man-made cut for the tailrace is ranked as one of the largest ever made in the U. S.

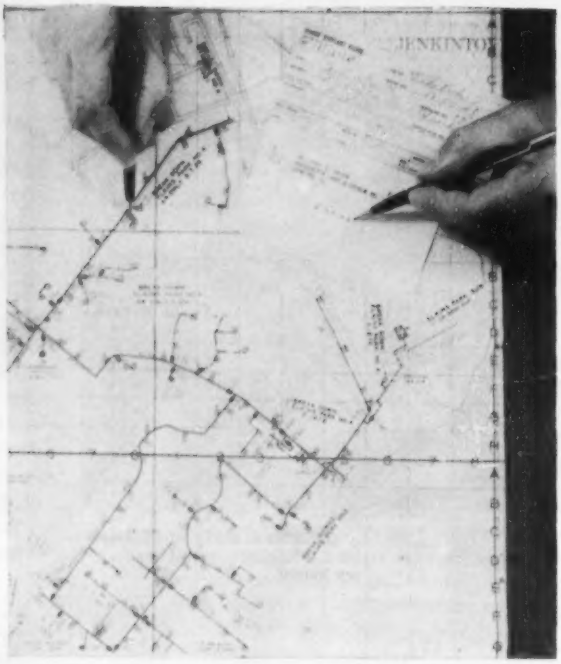
Powerhouse for the project is being erected in a 70 by 230 ft hole carved 72 ft deep out of granite.



LONG DAM, which stretches distance of 3,000 ft, will require 250,000 cu ft of concrete. Half that amount already has been poured

TAILRACE (shown above and at left) is being carved out of solid granite. It will be one and a half miles long. Work is about 70% complete

PUBLISHED INSTRUCTIONS cover all ramifications of restoring electric service in any emergency conditions



COORDINATED MAPS provide system data to complete complaint form before Trouble Analyzer dispatches repair manpower

HORACE MacVAUGH, General Superintendent, Suburban Divisions, Electric Transmission and Distribution Department, Philadelphia Electric Co, Philadelphia, Pa.

Modernized Procedures Speed

Philadelphia Electric's published techniques prove value

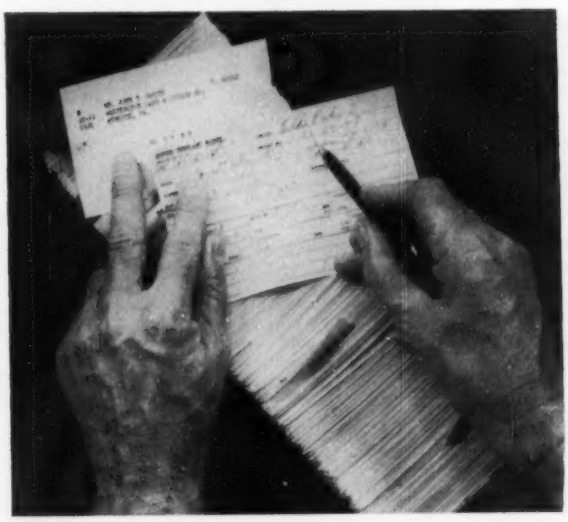
CALL TAKING during an emergency period may be delegated to personnel from the commercial and clerical departments as in photo above. At right, two gas department employees and a storekeeper are consulting the street index for precise trouble-spot information

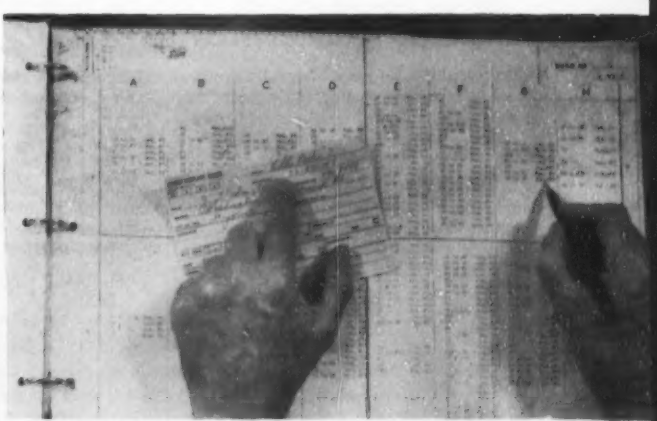
DISPATCHING OPERATIONS are carried out in storm center office where trouble experts pinpoint repair crew jobs. Complaint forms carrying all pertinent information about the trouble speed work of skilled personnel at these nerve centers

Storm-Area Service Restoration

in pinpointing system trouble spots for repair crews

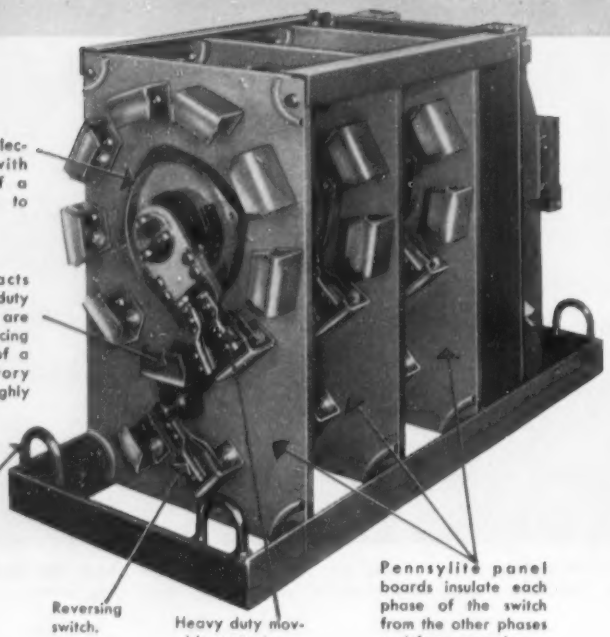
Turn to page 19 to see how . . .





CUSTOMER INDEX CARDS, like the 3 x 5-in. card shown above, show addressographed rural customer's address, service pole, and transformer. At right is the circuit index listing the location numbers and the distribution circuit fed from each distribution transformer

Only in PENNSYLVANIA LOAD TAP CHANGING TRANSFORMERS do you get


Collector rings of electrical bronze with sliding brushes of a different bronze to prevent galling.
Stationary contacts made of heavy duty electrical bronze are faced at the arcing edges with tips of a sintered refractory material which is highly resistant to erosion by arcing.
Hook Eyes for lifting assembly in and out of tap changer compartment.
Reversing switch.
Heavy duty movable contacts.
Pennsylite panel boards insulate each phase of the switch from the other phases and from ground.

Silent Snap* TAP-CHANGING ACTION

Here is the Pennsylvania Load Tap Changer that combines quiet operation with a contact breaking and making mechanism that has a variable speed — fast, then slow.

THE SILENT SNAP SWITCH *Starts Fast*

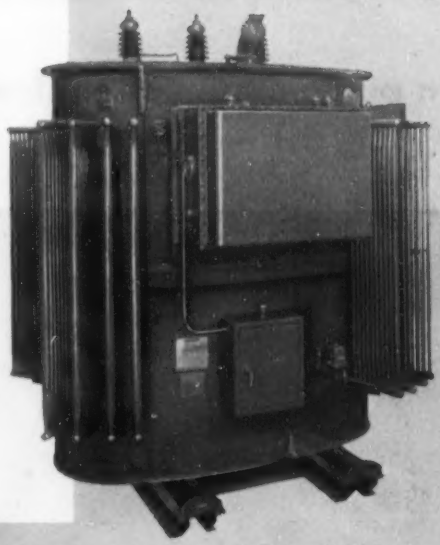
The Geneva gear, which positions the switch for every step, turns slowly and independently of the tap changing contacts. Three drive springs are released from a compressed state and actuate the movable contacts with a lightning-fast snap action. Swift contact separation reduces the arcing time to a minimum and thereby extends the life of the contacts. Operation is the same, whether the mechanism is driven electrically or manually.

THE SILENT SNAP SWITCH *Stops Gently*

Pennsylvania's exclusive hydraulic shock absorber action, which cushions and absorbs the impact energy, stops the contacts in their new position — *smoothly* and *quietly*.

THE SILENT SNAP SWITCH *is Quiet*

Quiet equipment is especially desirable for installation in residential areas where undue noise, formerly associated with load tap changing equipment, is obviously objectionable. Since the Silent Snap switch operates *quietly*, without the banging of metal against metal, mechanical fatigue and mechanical wear are reduced to a minimum.



Pennsylvania Load Tap Changing transformers with the Silent Snap switch are available in sizes up to 7500 Kva and in all voltages.

PENNSYLVANIA TRANSFORMER COMPANY
A McGraw Electric Company Division • **CANONSBURG, PA.**

For complete information, write to Pennsylvania Transformer Company, Canonsburg, Pa., and ask for Catalog 5112.

*Trade-Mark

How Philadelphia's Procedures Speed Service Restoration

Philadelphia Electric Co surveyed its handling of the first emergency testing its new trouble procedures this summer when heavy rain, lightning, and 65-mph winds struck in the northwestern section of its system. And what it saw gave reason for satisfaction with its "Associated Procedures for the Emergency Restoration of Electric Service." Experience with hurricane Hazel has done little to change this view.

The organization and procedures employed during the storms are described in this book, prepared and published by the company's Electric Operations Transmission & Distribution Department. This publication, setting forth the new operating procedures for the prompt restoration of service after an area catastrophe, was issued last March 15. Its directives cover severe emergencies and storms of lesser intensity, procedures differing primarily in the steps activated.

Organization and Procedures . . . At the first indication of trouble emergency organization starts and is extended according to a pre-determined plan as incoming reports indicate the extent of damage. Features of the plan are:

1. Complete mapping of system facilities, with a coordinated index in which six characters identify one specific area about the size of a city block.

2. A card index of streets and numbers, showing the supply transformer locations.

3. A card index of rural customers by name, giving the best known address, service pole number, map area, and primary circuit.

4. A prearranged restoration procedure for each transmission line and distribution circuit.

5. Establishment of a central clearing bureau for coordinating all system-wide information.

6. Maintenance of storm centers including all facilities for receiving customer complaints, analyzing trouble, and dispatching repair crews.

7. Maintenance at all storm centers of tool and material kits for equipping emergency crews.

8. Adequate telephone and radio communication.

9. Advance training of qualified personnel in all departments and assignment to emergency locations and duties.

10. Setting up storerooms and garages to expedite restoration.

11. Establishment of a set pattern for disseminating storm warnings.

This small book is divided for easy use into seven sections, four dealing with procedures for general and specific phases of the restoration problem and three giving information for implementing the procedures. Sufficient copies have been distributed to apprise personnel of management's aims and each person's duty in an emergency. The book presents both new procedures and familiar ones more positively stated than heretofore.

Analyzing Complaints . . . The sections on analyzing service complaint records provide methods for dealing with the many calls received in an emergency. They explain how to analyze and summarize them and how to dispatch trouble crews. One applies to the centralized organization in Philadelphia whose whole responsibility is trouble work; the other is designed for the decentralized, more sparsely settled, and lightly loaded suburban areas which are relatively lightly manned. Some 2,000 sq mi of suburban and rural territory, with relatively low customer density, comprise the suburban division.

A comprehensive system map (EW, Jan. 5, 1953, p 23) now shows the distribution and transmission circuits, poles, transformers, secondaries, service locations, and other geographical information. It is divided into 66 quads, each giving the complete topography at 800 ft per in. of an area 41,600 x 27,200 ft. Eight grid lines, identified A to H, divide each quad vertically, and another eight grid lines, numbered 1 to 8, horizontally. Each quad is subdivided into 64 areas 5,200 x 3,400 ft, which in turn are expanded to a 200-ft-per-in. scale in area plates.

The area plates are also divided eight ways both vertically and horizontally, the lines being again identified as above. In this manner an area 650 x 425 ft, somewhat smaller than a city block, can be positively designated. For example, in the designation 49-G4-B7, the 49 is the quad, G4 the area plate, and B7 the city block section of the area plate. These symbols can pin-point transformer location numbers as more than one transformer are seldom installed in so small an area. When there are more than one, the transformer can be particularized by a capital letter, as in 49-G4-B7-D.

Procedures in Action . . . What happened during the storm, first appear-

(*Continued on page* 20)

PE's Conclusions Following "Hazel"

1. The value of a comprehensive procedure as an aid in combating the effects of a "Hazel" was proved beyond question.

2. "Hazel" was three times as bad in its effects as the worst previous storm sustained on Philadelphia Electric Company System.

3. 95% of the trouble was caused by trees.

4. Even the best obtainable tree trimming on open wire portions of a circuit, supplemented by aerial cable, is not enough to avoid the effects.

Areas for Further Study

1. Provide emergency stock piles of equipment and tools, particularly line trucks, located strategically over the system.

2. Are available normal transmission and distribution payroll forces adequate and properly distributed?

3. What better methods can be used to storm-proof the densely-settled, heavily treed area.

4. The assignment of people from other departments on a crew basis. Who will report on most storms rather than just the catastrophe? Who will work as a unit in a given area and be used for inspection, patrolling, and other incidental duties.

5. A whole list of odds and ends—small portable generators, their application and distribution; mobile catering service for personnel feeding; dormitory housing; air and rail transfer of help.

ing imminent about 10 PM, shows the trouble procedures in action.

The load dispatching division, through established channels, notified every operating division of its approach. Supervisors were immediately notified to report for duty. Aided by early reporting personnel, they phoned to get forces to man complaint boards, storm centers, and street gangs. The storm struck before these calls were completed.

All classifications of employees (more than 1,000 were finally involved) were reporting very shortly. Complaint boards were manned, and calls were received and speedily processed by groups assigned to the customers' file or the street or circuit index. Analyzers, developing trouble cases, prepared orders for dispatching trouble crews as they were formed and equipped. Trouble calls were received in all locations, and T&D management, functioning as central clearing bureau, collected system data for a preliminary summary of conditions.

The first summary about 12:30 AM of known troubles, either corrected or awaiting street crews, disclosed that some areas were more severely hit than others. This signalized for the immediate transfer of personnel and a recheck of personnel availability lists. System checks of the progress of restoration were made every two hours until morning, and personnel shifted as conditions warranted. The division most seriously affected finally acquired an emergency working force about twice its normal force.

Pinpointing Effective . . . The storm had some unusual aspects: its very rapid build up, its almost simultaneously damaging effect in all parts of the area, and the lateness of the hour at which it struck. There were almost 600 cases of aerial wire failure and almost 500 cases of line or transformer fuse failure. By midnight 15% of the suburban customers had suffered service interruption.

With the storm passing and reports of new damage easing off, supervisors knew what had been corrected, what was still out, what damage reports were still to be expected. They could congratulate themselves because they had picked the "next job" more precisely than ever before, they had pinpointed street forces to specific circuit locations rather than to general areas, and order and efficiency had prevailed in emergency headquarters.

By morning all major troubles were corrected, and some 90% of the customers interrupted had their service restored.

New Residential Wiring Handbook Raises Standards

New edition of the Residential Wiring Handbook (EW, Sept. 20, p110) is now being distributed, announces the Industry Committee on Interior Wiring Design.

Completely revised by the Committee the new Handbook supersedes the 1946 edition, and raises the standard for wiring adequacy to a minimum of 100 amp for service entrance capacity in all residential housing of 3,000 sq ft of floor area or less. In addition to individual equipment circuits, at least one 3-wire general appliance circuit appears as a standard, and 3-wire branch circuits with split-wired receptacles are recommended for livingroom and bedrooms.

The revisions of the new Handbook represent the first change since 1946 in adequacy standards which are advocated nationally by the National Adequate Wiring Bureau and the 75 local bureaus which certify wiring in new housing. Booklet follows a decision of the National Association of Home Builders to adopt on a voluntary basis the 100-ampere service entrance.

Changes in the design of today's new homes and in the living habits of their buyers are reflected in the new standards. The Handbook premises its wiring design standards and recommendations on the one-story, open floor plan house with multi-purpose rooms. The standards also are applicable to two-story or multiple-family dwellings and in the rewiring of older homes.

Factors taken into account by the Industry Wiring Committee in preparation of the Handbook were: (1) the now widely accepted role of air conditioning in all classes of housing; (2) the need for added individual circuits for numerous laundry and kitchen appliances in homes where the income level is modest, but where the demand for and supply of new housing is greatest; (3) the probability of continued rapid increase of demand on home electrical systems as new equipment comes onto the market.

The new Handbook, like its predecessor, should be of substantial aid to architects, engineers, builders, contractors, lending institutions, and other organizations concerned with home building and planning. Prospective home owners and those now planning remodelling of their present homes should find practical, efficient wiring systems, with both floor plans and text easily understood by men with no technical experience. However, the Handbook emphasizes that its purpose is to show how to plan wiring system, and not how to make the actual installation.

Copies of the Handbook may be purchased at 25 cents per copy from the Adequate Wiring Bureau, 155 East 44 St, New York; the Edison Electric Institute, 420 Lexington Ave, New York, or from the headquarters office of any of the sponsoring organizations.

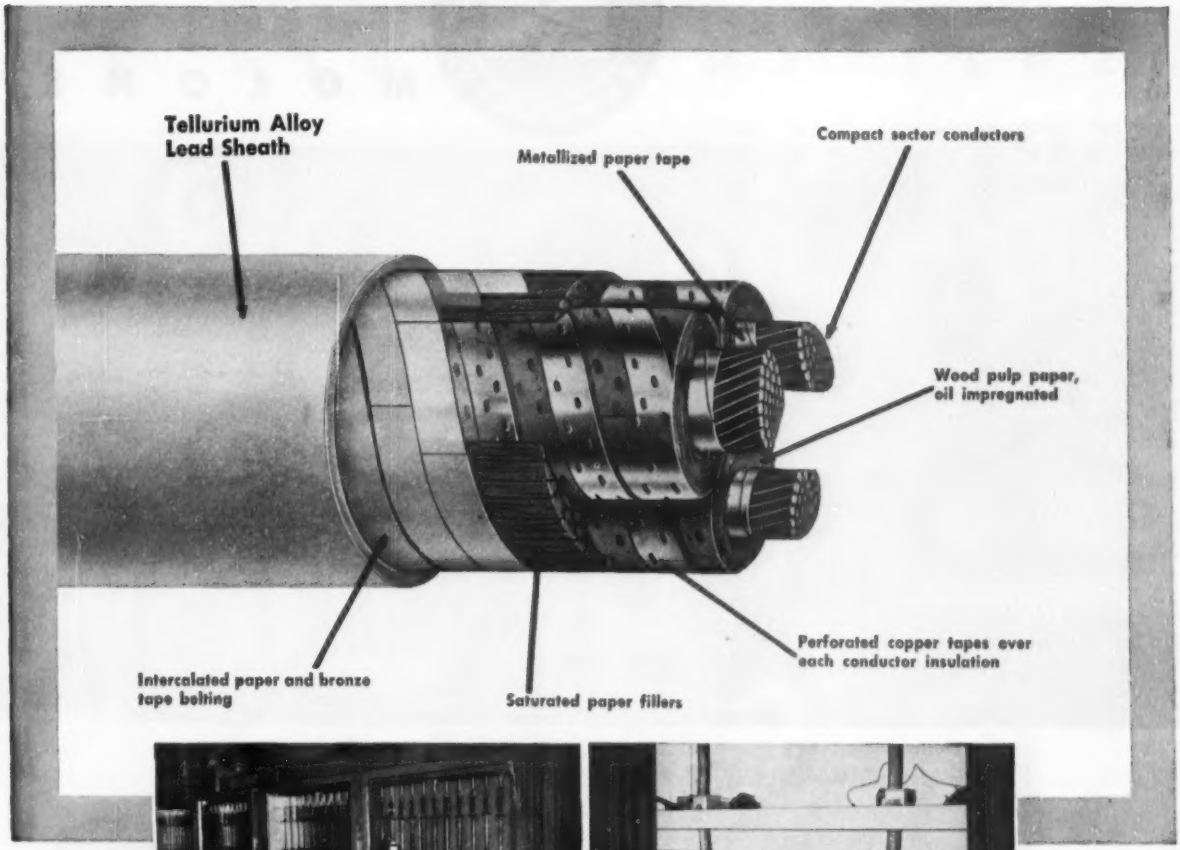
Seattle Lets Contract For Ross Transformer

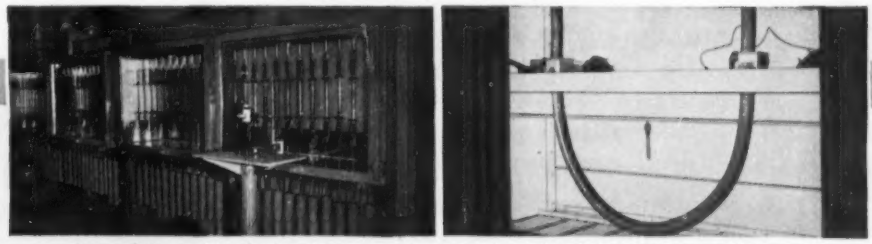
After receiving bids on three different occasions, the Seattle Board of Public Works finally has been able to award a contract for manufacturing and installing the fourth 90,000-kva transformer in City Light's Ross powerhouse on the Skagit River.

The award, for $1,375,000, went to Westinghouse Electric Corp., with delivery promised by January, 1956. American-Elin Corp figured low at $1,138,870 but did not fulfill specified requirements on delivery time and excitation equipment, said Paul J. Raver, City Light superintendent. It proposed delivery in 580 days. A letter claiming a clerical error and reducing the time to 550 days was submitted too late for consideration.

Bids received on two previous occasions were rejected as too high or failing to conform to specifications.

FOR INCREASED LOAD REQUIREMENTS...PAPER INSULATED CABLE WITH TELLURIUM ALLOY LEAD SHEATH


Tellurium Alloy Lead Sheath
Metallized paper tape
Compact sector conductors
Wood pulp paper, oil impregnated
Perforated copper tapes over each conductor insulation
Intercalated paper and bronze tape belting
Saturated paper fillers



Some of the specially-developed testing equipment with which Roebling maintains quality control of the production of Tellurium Alloy Lead Sheath. #1 Temperature control ovens for creep test of strips cut from tellurium alloy lead cable sheathing. #2 Temperature control oven for bending fatigue test of full cable section.

YOU'LL REALLY solve power cable headaches with Roebling Paper Insulated Cable with the new Tellurium Alloy Lead Sheath*, a Roebling exclusive. Here are some of its outstanding advantages:

1–Tellurium Alloy Lead Sheathed Cable has a lower long-time creep rate;
2–Extra high fatigue resistance;
3–High bursting strength;
4–Exceptional stability under heat application as in duct splicing and wiping;
5–Abolishes need for frequent stop joints or reinforced lead sheath;
6–Doesn't require generous expansion bends or large manholes;
7–Heat application in splicing leaves its desirable properties unimpaired.

WRITE US FOR FULL DATA. John A. Roebling's Sons Corporation, Dept. 707, Trenton 2, N. J.

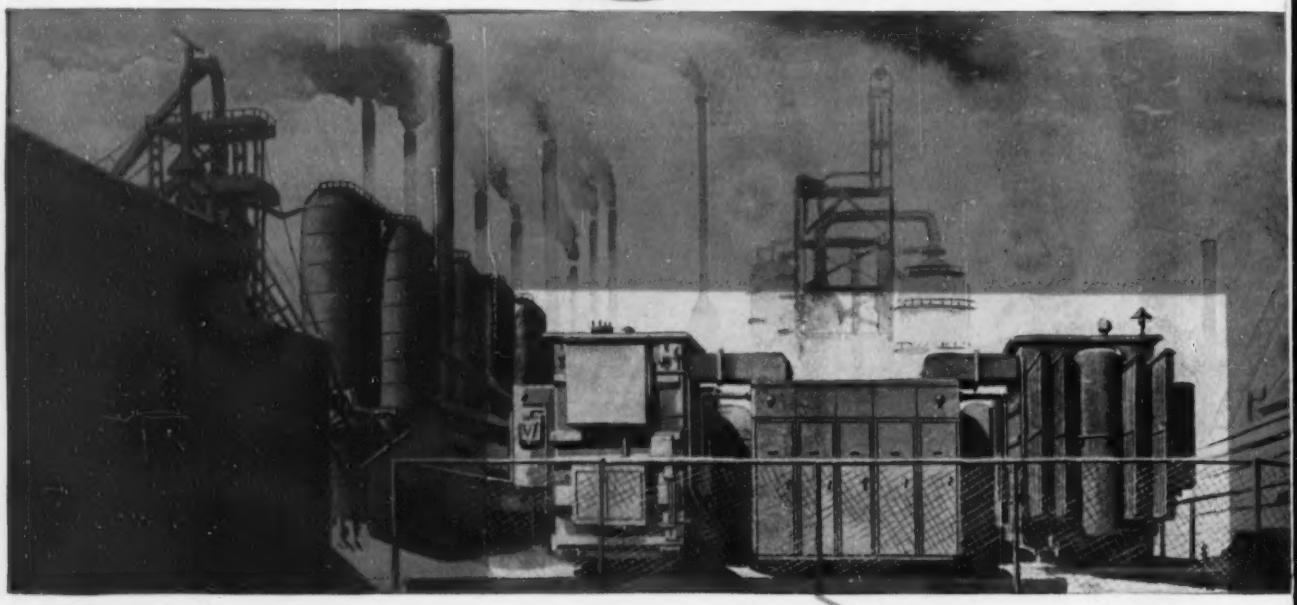
ROEBLING

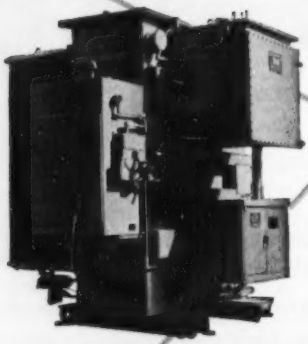
SUBSIDIARY OF THE COLORADO FUEL AND IRON CORPORATION

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13235 LAKEWOOD HGTS. BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, ROOM 239, HENRY W. OLIVER BLDG. • ROCHESTER, 1 FLINT ST. • ST. LOUIS, 3001 DELMAR BLVD. • SALT LAKE CITY, 526 W. 8TH SOUTH STREET • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 331 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

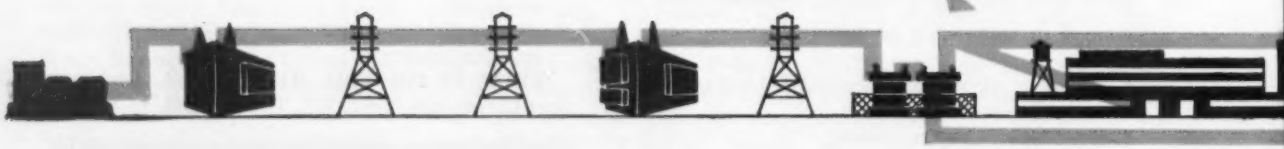
MOLONEY ELECTRIC

MOLONEY..





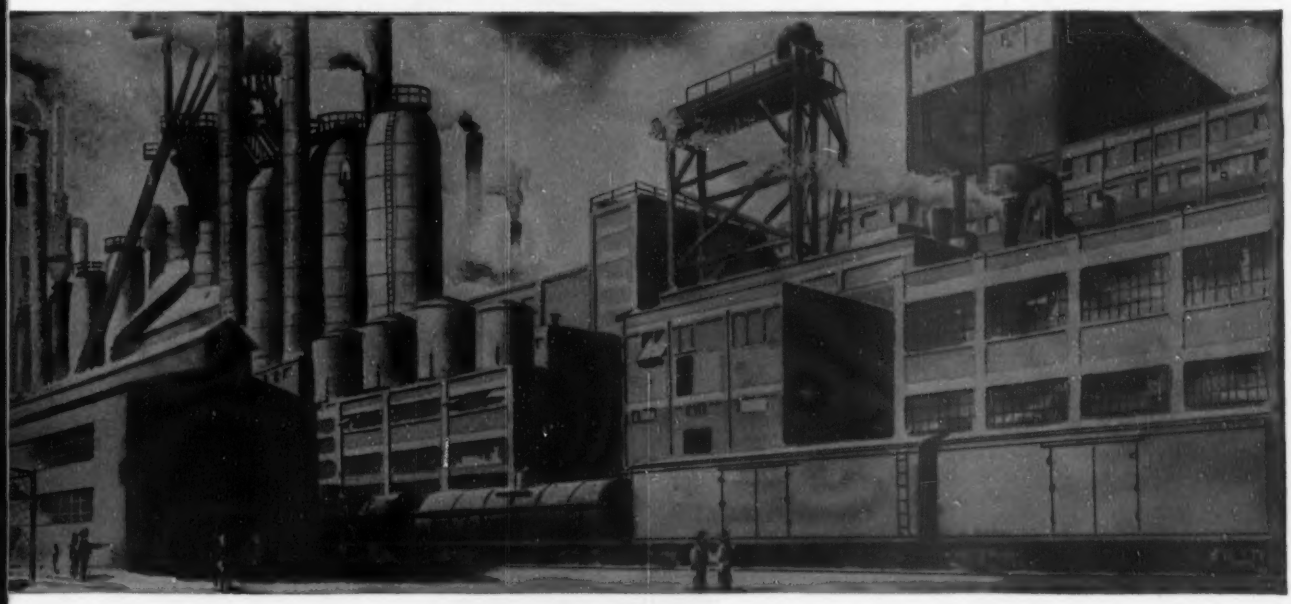
2500/3125 Kva Class OA/FA Load Ratio Control Transformers, three phase, 60 cycle, rated high voltage 34500 volts delta with disconnect switch, low voltage 5018 volts delta with plus or minus 10% regulation in 32 steps of ⅝%.



SALES OFFICES IN ALL PRINCIPAL CITIES • FACTORIES

For years the name Moloney on a transformer has meant a better product. As utilities have grown and become more complex, so have transformers. All this expansion in the power field has been paralleled by expansion here at Moloney. Many utilities feel that Moloney Transformers are the best you can buy. They are right, because—

. . A L L A L O N G T H E L I N E !



Take, for instance, Load Tap Changing Equipment; With dependable Moloney Automatic Load Tap Changing Equipment, a well regulated voltage system will result which offers advantages to both utility and consumer. The consumer advantage is trouble free functioning of equipment utilizing designed performance. The Utility advantage is utmost power delivery at times when power demands are profitable.

Moloney Load Tap Changing Equipment provides a positive power supply at a constant voltage. Only Moloney Load Tap Changing Equipment has the exclusive principle of reactor by-pass switching.

Available for Step Voltage Regulators, Regulating Transformers, Load Ratio Control Transformers, Phase Shifting Transformers or Special Applications.

MER4-21

MOLONEY ELECTRIC COMPANY

Power Transformers • Distribution Transformers • Step Voltage Regulators • Regulating Transformers • Load Ratio Control Transformers • Unit Substations • Network Transformers • Constant Current Transformers • Capacitors • Transformers For Electronics

AT ST. LOUIS, MO. AND TORONTO, ONT., CANADA

POWERS American SERVICE BODIES AND EQUIPMENT

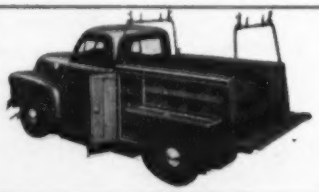
The 1 Source
for utility bodies and equipment!

If your work calls for one service body or a hundred . . . if you can use standardized units or require custom-made equipment . . . you'll find a body to fit your needs in the Powers-American line. Ladders, reels, racks, hooks, brackets, shelves, and other special items of equipment, can be furnished for your particular work requirements.

May we help you with your service body problems? Complete details will be sent upon request.

Series 44L and Series 44 (shown above) designed for any general service work. Fully-equipped with shelves and bins. For ½, ¾, 1, and 1½ ton chassis.

Series 25T and 35T arranged for telephone installation and service. Widely used in other phases of utility work. Available in ½ and ¾ ton sizes.



Series 25M and 35M used for all types of general service. Especially suitable for electric meter installation and maintenance. Models for ½ ton and ¾ ton vehicles.

Series 25G and 35G designed for use in the installation and servicing of gas meters. Equipped with meter hold-downs, bins, and pipe rack. In ½ and ¾ ton sizes.

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McCABE-POWERS AUTO BODY COMPANY

5900 NO. BROADWAY • ST. LOUIS 15, MO.
428 LATHAM SQ. BLDG. • OAKLAND 12, CALIF.

Garrison Dam Embankment Finished

The earth-filled embankment of Garrison Dam, shown above crossing the Missouri River in central North Dakota, was completed this month after seven years' work. The embankment, believed to be the largest in the world, was built at a cost of $44 million

The two and a half mile long embankment is 1,200 ft wide at its base, 210 ft high and 60 ft wide at the peak. Concrete building in lower left is intake structure for eight tunnels housing gates and control machinery. Tunnels go under the embankment to powerhouse area at right.

Council May Hike Output at Coulee, Chief Joseph

The Puget Sound Utilities Council would consider building a third powerhouse at Grand Coulee Dam and adding two generators at Chief Joseph Dam to utilize water stored behind the proposed Mica Creek Dam upstream on the Columbia River in Canada, a member of the council has declared at Wenatchee, Wash.

Jack Stevens, consulting engineer for the council, previously had declared that downstream storage benefits from the Canadian project would make the new capacity feasible at Grand Coulee and Chief Joseph.

Stevens declared that the 10.6 million acre-ft of usable storage from the Canadian development would increase the Columbia River's low flow at the two dams to the point where all existing generators at Grand Coulee could run most of the year and six others of like size would be needed there, plus two more at Chief Joseph and another two at The Dalles Dam. Authorization of the Grand Coulee powerhouse would have to come from Congress.

Stevens said the government could be repaid for its investment in the third powerhouse in blocks of power provided by the council.

"We would provide the storage and the federal government would provide the generators," he said, should such a plan be adopted.

The Mica Creek development ultimately would provide 1.2 million kw for the Pacific Northwest, with members of the council to build the dam for $250 million and Canadian interests to build a powerhouse on the site.

Preference Customers Assured of BPA Power

Full power requirements of preference customers of Bonneville Power Administration are assured for the next 12 years by the construction pace of existing federal dams on the Columbia River. This was the view of Assistant BPA Administrator Byron L. Price in a speech at the annual meeting of the Wasco County, Ore., Electric Co-operative.

This presumes the present 10,000-kw limitation on new industry loads remains effective and generator schedules of U. S. plants are unchanged for some 3 million kw of name-plate capacity which are under construction.

Nonpreference customers, the industries as well as private utilities, will be off BPA service lines by 1964 unless new dams are started, he predicted. Price reported BPA estimates the region will need 9 million kw of new generation in the next 20 years, equivalent of 18 Bonneville dams. The assistant administrator said public and private utilities are moving to ease the pressure. He noted public agencies have filed for some 15 sites with potential of 3 million kw and private utilities have filed on 14 with potential capacity of 1 million kw.

Price predicted a more diversified industrial growth for the Columbia River Basin because of the potential for fertilizers, plastics and synthetic fabrics based on resources of the basin and low cost hydroelectric power. But he said electroprocess type plants, which were encouraged to locate in the region in the 1940's after Bonneville Dam was built, will not expand unless new large hydroelectric projects are started soon.

Price praised the role of the co-op in making it possible for virtually all Wasco County farms to be electrified. In 1940 only a third had electric service, he reported.

NW Group Seeks to Add 850,000 Kw on Snake

Pacific Northwest Power Co has applied to the Federal Power Commission for a preliminary permit to investigate the feasibility of constructing hydroelectric projects at Mountain Sheep and Pleasant Valley on the Snake River to provide a total of 850,000 kw.

Proposed development, expected to cost over $200 million, would serve future growth needs of these companies: Pacific Power & Light, Washington Water Power, Montana Power, and Portland General Electric, which jointly formed Pacific Northwest.

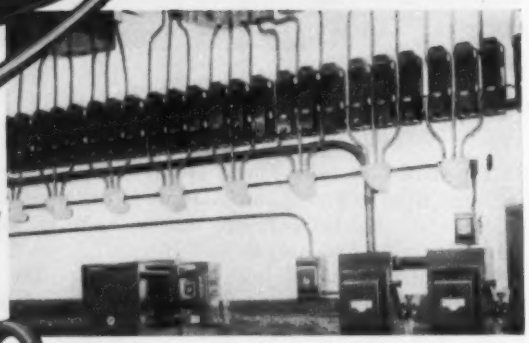
Mountain Sheep project contemplates a 233-ft dam with generating capacity of 250,000 kw. Pleasant Valley would have a 492-ft dam with 600,000 kw installed generating capacity.

Pacific Northwest has abandoned plans for Penny Cliffs Dam on Clearwater River in northern Idaho due to opposition from wildlife groups.

Here's a lot of switch in a small space

This Matthews Enclosed Disconnect Reduces Space Requirements

Switch may be swung toward pole with this swivel-type bracket that conforms to NEMA mounting arrangements.



Thirty #475 Matthews Disconnect Switches in a Minnesota power plant

Pry-out leverage makes switch easy to open with disconnect stick.

All Matthews Disconnects are given 31,000 to 45,000 volts high potential tests *after assembly* to detect any hidden weakness in porcelain.

DEAD-BLADE DESIGN... When blade is down, it is absolutely safe because all contacts are above the hinge... the blade is *dead*.

Utility companies who use the Matthews Disconnect Switch agree, there's a lot of switch packed into its space-saving, porcelain housing. They like its ruggedness, its high dielectric values, its *compactness*—only minimum space is needed for either cross arm or vault installations.

Available in 100 to 600 amperes, 5 KV and 7.5 KV ratings, Matthews Disconnects are especially easy to operate. When your lineman gives the pulling eye a yank with his hot stick, the pry-out blade helps him to break contact. A spring catch on the molded bakelite door keeps the door up and out of the way. Another spring catch holds the door securely shut to protect the switch in open or disconnect positions.

Tight, "non-freeze," point-type contact is guaranteed at all times by slotted clips. Yoke-type terminal lugs prevent spreading of terminal lead strands. And... the liberally designed Matthews Disconnect insures cool operation—there is exceptionally low heating at the full rated load.

You don't have to worry about radio or TV interference with a Matthews Disconnect either. There are no loose or isolated parts. Whatever the blade's position, cupped washers exert constant pressure on the blade where it is attached to the housing.

All Matthews Disconnect Switches can be furnished with plated terminal lugs for aluminum conductors at slight extra cost. Quick-break blades are available in the 200 and 400 ampere sizes.

If you want a disconnect that's easy to operate, rugged, yet *compact*, specify Matthews the next time you order.

A·B·CHANCE CO·

CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

CS54-16

BPA Resumes 345-Kv Line

Minor changes in methods are adopted after development of surface irregularities halted construction in September

Stringing of the 1.6-in. ACSR conductor for the McNary-Wishram portion of Bonneville Power Administration's 345-kv line from McNary Dam to Big Eddy, Wash., was resumed on a regular basis Nov. 15. In reporting to Electrical World, BPA chief engineer Eugene C. Starr said no particular departures have been made from the original method of stringing cable (EW, Sept. 13, p30-32).

Minor changes in procedure grew out of experimental stringing methods that were tried after irregularities in the cable surface halted construction of the line (EW, Sept. 20, p110). Stringing winches will assist in maintaining tension at a level sufficient to keep the conductor off the ground. Rubber-lined sheaves will be used to prevent damage to the conductor surface.

It is thought that these procedures will eliminate flaring or rises in the outer strands of the cable. While the irregularities did not change the mechanical properties of the cable, they would result in an increase in radio interference due to corona. Engineers of Aluminum Co of America, the manufacturer of the original cable, worked with the stringing contractors, Bay Construction, Inc, and Don L. Cooney, Inc, both of Seattle, to find a satisfactory stringing procedure.

Alcoa Has New Stranding Machine . . . Alcoa recently completed installation of a new "continuous stranding" machine at its Vancouver, Wash., plant similar to the one that has been in operation at its Massena, N. Y., works. Several reels of cable made on this equipment have been supplied to BPA for experimental use on the 345-kv line. The original 1.6 in. ACSR, was made by a repeated stranding or "overlay" method used by the industry for many years.

At this writing it is not clear whether BPA will continue stringing with the original 1.6 in. cable or will adopt the continuous-stranded cable for the remainder of the line. The original contract was for $4 million worth of cable and Alcoa had delivered about 60% of the contract amount when work was halted.

Difficulties in stringing the 1.6 in. cable, the biggest of its size to be used by Bonneville or to be made by Alcoa, were not entirely unexpected. As Starr said earlier, "we expected some bugs to develop due to the new equipment and gear that had to be developed for the larger cable." And he pointed out that "the degree of tolerance for surface irregularities is extremely fine. As a result extreme care must be exercised both in the stringing operations and manufacture to avoid even the slightest flare of conductor strands or other irregularities."

POWER BRIEFS FROM THE NEWS

● Florida Power & Light Co is stepping up its ten-year construction program with an outlay of $410 million, which is more than $75 million over the previously announced $332-million program. As an initial step, Florida P&L approved the purchase of a 140,000-kw generator to be located in south Florida.

● Alabama Power Co has announced that preliminary engineering calculations indicate that the $20-million dam proposed to be built on the Warrior River will provide a minimum flow downstream of 732 million gallons per day. The utility is now awaiting Federal Power Commission approval for a preliminary permit for a multiple purpose project at a New Hope site and installation of a plant at a U. S. dam at Lock 17 on Warrior River. Capacity at the two sites will be about 90,000 kw.

● Army Corps of Engineers hopes to start work early in 1955 on plans for a $167-million dam and canal project on the Cumberland and Tennessee Rivers. Congress last year granted authority to plan for the power, flood control facility, but the $3 million needed for planning is yet to be appropriated. The 7,985-ft dam would have an installed capacity of 160,000 kw and an estimated annual output of 600 million kwhr.

● International Boundary and Water Commission has selected a site about 15 miles upstream from Del Rio, Tex., for the second of three international dams on the Rio Grande. Site selection is subject to the approval of the American and Mexican governments. Pre-design work is under way on the project which will be known as Diablo Dam. First project was Falcon Dam, which was completed in the summer of 1953 at a cost of about $50 million.

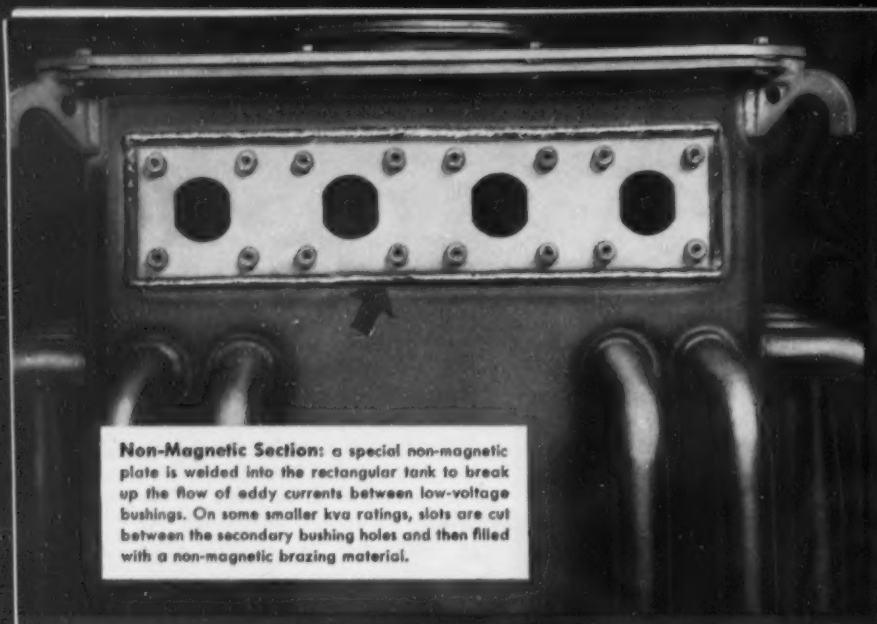
● Consumers Power Co plans to spend $50 million between now and 1957 to expand its Cobb power plant at Muskegon, Mich. A second 135,000-kw steam turbine-generator unit, supplementing an addition of similar size now under construction, will boost plant's capacity to 450,000 kw. Units are scheduled for service in 1956 and 1957.

● Army Corps of Engineers has placed two more 40,000 kw generators in operation at Fort Randall Dam, Neb., which will eventually produce 320,000 kw. The corps said the two units will bring uninterruptible power to Nebraska users for the first time. About 40,000 kw of uninterruptible power will be delivered to the Nebraska public power system at O'Neill, Neb.

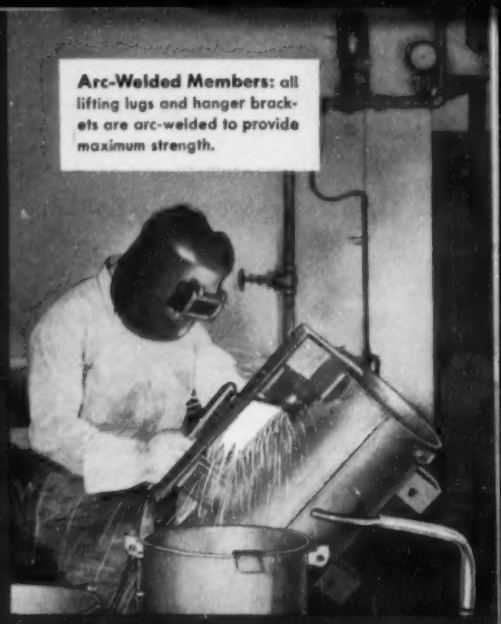
● National Academy of Science-National Research Council, Washington, D. C., is currently compiling the tenth addition of "Industrial Research Laboratories of the United States," a directory of American industries and businesses which maintain scientific research and development facilities. Publication is scheduled for mid-1955.

● Atomic Energy of Canada, Ltd, Chalk River, Ontario, has issued a bibliography of atomic power and related atomic energy topics for the non-specialist.

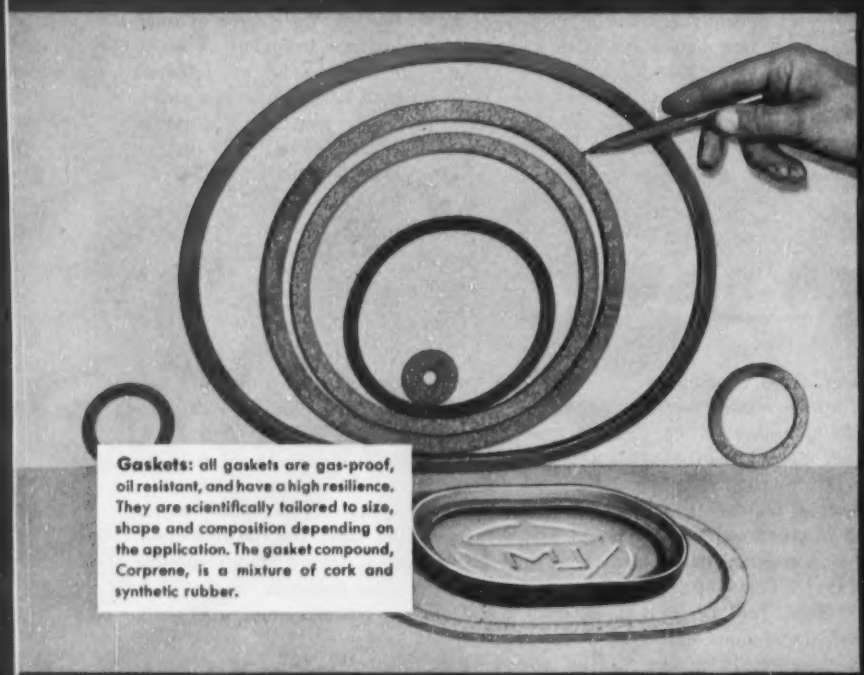
● Plans for a new 150,000 kw-unit for the plant at Grand Tower, Ill., have been announced by the Central Illinois Public Service Co.



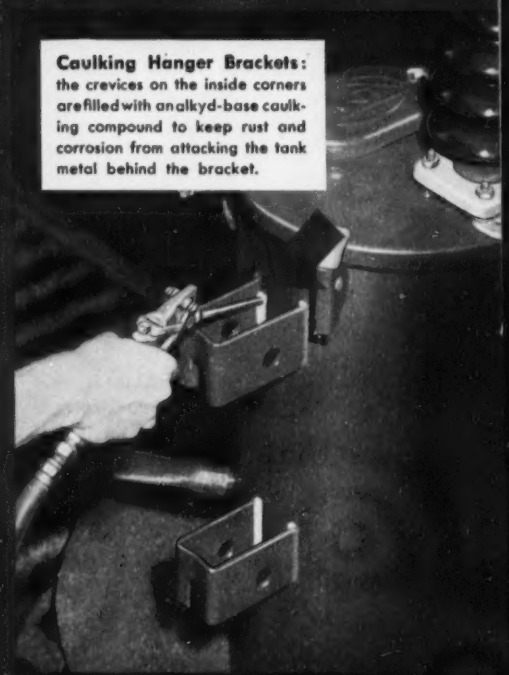
Non-Magnetic Section: a special non-magnetic plate is welded into the rectangular tank to break up the flow of eddy currents between low-voltage bushings. On some smaller kva ratings, slots are cut between the secondary bushing holes and then filled with a non-magnetic brazing material.



Arc-Welded Members: all lifting lugs and hanger brackets are arc-welded to provide maximum strength.



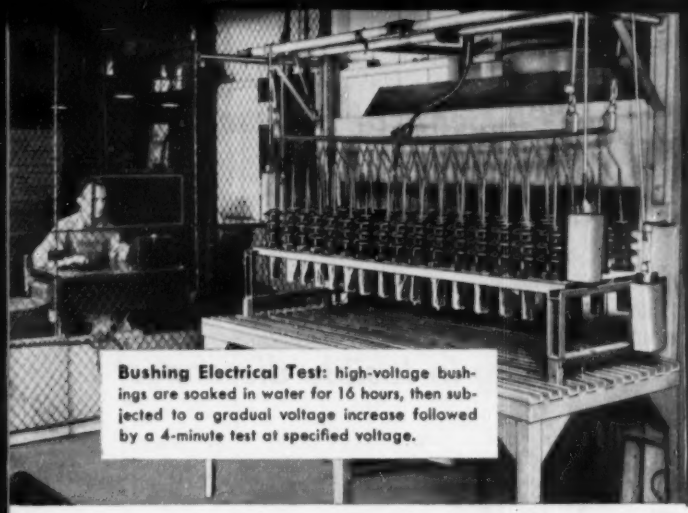
Gaskets: all gaskets are gas-proof, oil resistant, and have a high resilience. They are scientifically tailored to size, shape and composition depending on the application. The gasket compound, Corprene, is a mixture of cork and synthetic rubber.



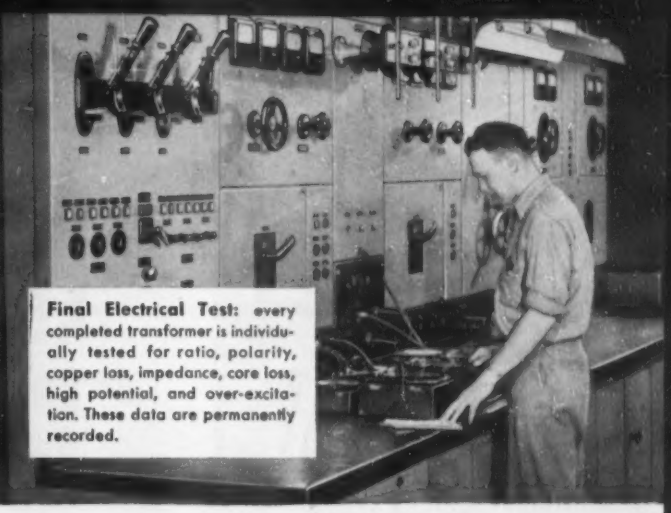
Caulking Hanger Brackets: the crevices on the inside corners are filled with an alkyd-base caulking compound to keep rust and corrosion from attacking the tank metal behind the bracket.

Stainless Steel Bolts: the cover bushings are all secured with stainless steel, rust-proof bolts. You can easily remove or replace the bushings at any time.

Special Lock Screw: the tap changer has a special lock screw with nylon insert which is completely unaffected by vibration.



Bushing Electrical Test: high-voltage bushings are soaked in water for 16 hours, then subjected to a gradual voltage increase followed by a 4-minute test at specified voltage.



Final Electrical Test: every completed transformer is individually tested for ratio, polarity, copper loss, impedance, core loss, high potential, and over-excitation. These data are permanently recorded.

L-M's Round-Wound® Transformers Have

"The Little Things That Count"

By J. G. EVERHART
Chief Engineer
Transformer Division
Line Material Company

L-M Round-Wound transformers offer outstanding performance characteristics which are largely the result of the unique wound core and round coils wound directly onto the core.

In addition to this design advantage, L-M exercises particular care in the many "little things that count."

L-M engineers and production personnel are specialists in distribution transformers. Thus, any problem in the design, manufacture, or application of distribution transformers, regardless of how minor it may seem, merits their consideration and specialized knowledge.

Experience has shown that this attention to the details in design, assembly, inspection, and testing adds appreciably to the service life of the Round-Wound transformer, to its exceptionally low failure rate, and to its over-all performance characteristics.

Get The Whole Story On Round-Wound Transformers

A 16mm. color-sound motion picture film is available for showing to members of your organization, illustrating the construction of L-M Round-Wound transformers and the care taken in "the little things that count." Ask the L-M Field Engineer for complete information, or write Line Material Company, Transformer Division, Zanesville, Ohio (a McGraw Electric Company Division).

Some of the Little Things That Count for the User

COIL:

Each coil is tagged, identifying rating, winder, wire manufacturer . . . assures control for better quality.

Extra low voltage ties . . . give added axial short circuit strength.

Varnish dip . . . provides excellent mechanical strength under short circuit.

Vacuum oil impregnation . . . assures corona-free operation and uniformly high dielectric strength.

TANK:

Everdur cover bolts (large rectangular tank units) . . . eliminate rusting, provide high mechanical strength.

Stainless steel mounting bolts—cover bushings . . . facilitate bushing removal or replacement; no rusting.

Self-locking anchor nuts . . . secure the core and coil assembly against vibration or other accidental loosening.

Scientifically selected Corprene (TM) gaskets... combine gas proofness and oil resistance with proper resilience for quality seal.

Arc-welded lifting lugs and hanger brackets . . . assure positive and permanent strength of load-carrying parts.

Caulked hanger brackets . . . prevent exposed-crevice corrosion.

Non-magnetic slots and plates in tank wall . . . reduce eddy current losses.

Petroleum jelly on secondary spades . . . prevents corrosion.

SMALL TAP CHANGER:

Fiber glass reinforced alkyd resin body . . . lengthens vertical creepage paths from line to ground.

No live parts on top of tap changer . . . increases safety.

Self-aligning line lead knob for hand tightening . . . provides maximum torque with minimum effort. Impossible to cross thread. No tools necessary.

EXTERNALLY OPERATED TAP CHANGER:

"Lifetime" Teflon (TM) shaft seal. Non-corrosive external parts. Positive positioning locking device. Self-aligning, self-wiping contacts. Stainless steel shaft.

All these features eliminate corrosion, prevent binding, assure positive, low-resistance connections, and help provide a long-lasting, smooth-operating mechanism.

TESTING:

Steel and wire acceptance tests and controls. 100% primary bushing electrical test. 100% preliminary core loss test. 100% preliminary coil ratio and polarity test. Core and coil assembly test. Leads and connections mechanically and electrically tested. Casing inspection. Power factor test.

These are examples of in-process quality control leading to over-all quality of a uniformly high level.

Final electrical line test. 100% testing for ratio, polarity, copper loss, impedance, core loss, high potential and over-excitation. Thorough testing of completed unit before shipment is final step in control for better quality.

Test records and data kept permanently on file . . . make complete design and test information always available.

Oil leak test . . . assures oil-tight welds and positive seals and gasketing.

GENERAL:

Terminals tin coated . . . gives low resistance; minimizes galvanic action when aluminum wire is used.

Swaged connections . . . have low resistance; are mechanically secure.

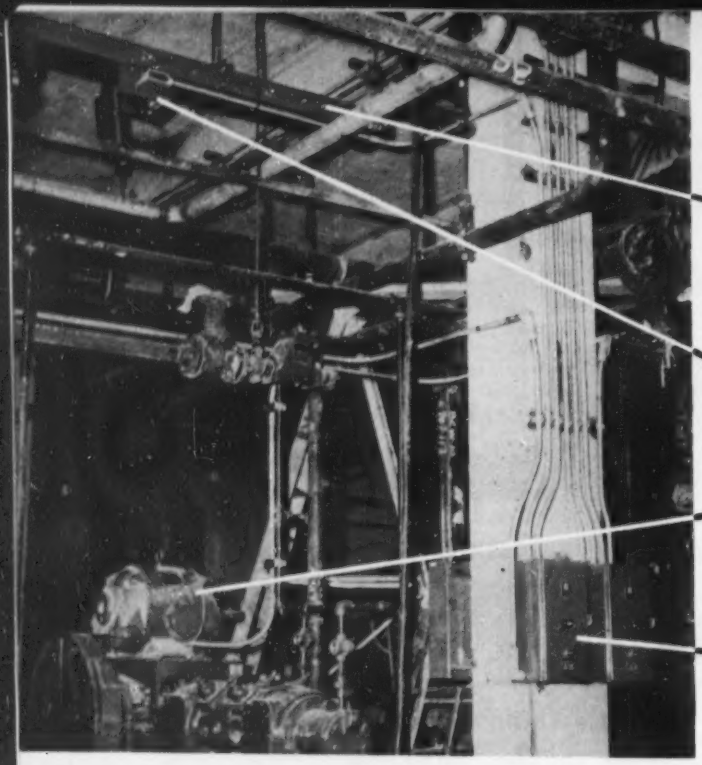
Inspection tags . . . assure complete checking at 4 prime stations coded for identification.

Oil-impregnated, kiln-dried, maple coil support blocks . . . assure high mechanical strength with no possibility of subsequent loosening.

Temporary plastic covers (small units) . . . prevent contamination during fabrication.

ORTO-inhibited oil . . . prevents sludging, increases life expectancy of oil.

LM® LINE MATERIAL Transformers



Four Elements of System:

1. *Plug-in bus duct*
2. *Plug-in fusible disconnect*
3. *Motor*
4. *Magnetic Starter*

480-V Plug-in Bus Duct Cuts Cost

WILLARD B. SIMONDS, Electrical Engineer, Florida Power Corp, St. Petersburg, Fla.

Florida Power Corp is saving about $13,000 per generating unit by using industrial type plug-in bus duct for 480-v auxiliary power. This bus duct method is used instead of the conventional switchgear and motor control center type of control and distribution.

This material will first be used in the installation of the second unit of the company's Suwannee River Plant. This is a 30,000-kw unit and is scheduled for commercial operation in November 1954. It will also be used for a 75,000-kw unit at the Turner Plant. This unit is scheduled for operation in the fall of 1956.

Advantages of plug-in bus duct for power plant use are:

1. Lower first cost.
2. Saving in plant floor space.
3. Saving in future maintenance costs and down time.
4. Increased safety.
5. Ease of adding equipment or making changes.

No Control Centers . . . All large motors are fed directly from a split metalclad bus, rated either 2,400 or 4,160 v. The smaller motors (125 hp and below) are fed from two 480-v plug-in bus ducts. Power for the plug-in bus ducts is provided by a split bus 480-v switchgear. The switchgear receives its power from two transformers. The primaries of these transformers are fed from the two sections of the high voltage metalclad switchgear. The 480-v switchgear consists of only three circuit breakers, two transformer secondary breakers, and a bus tie breaker. Thus in this 480-v system there are no motor control centers and no motors are fed directly from the 480-v switchgear.

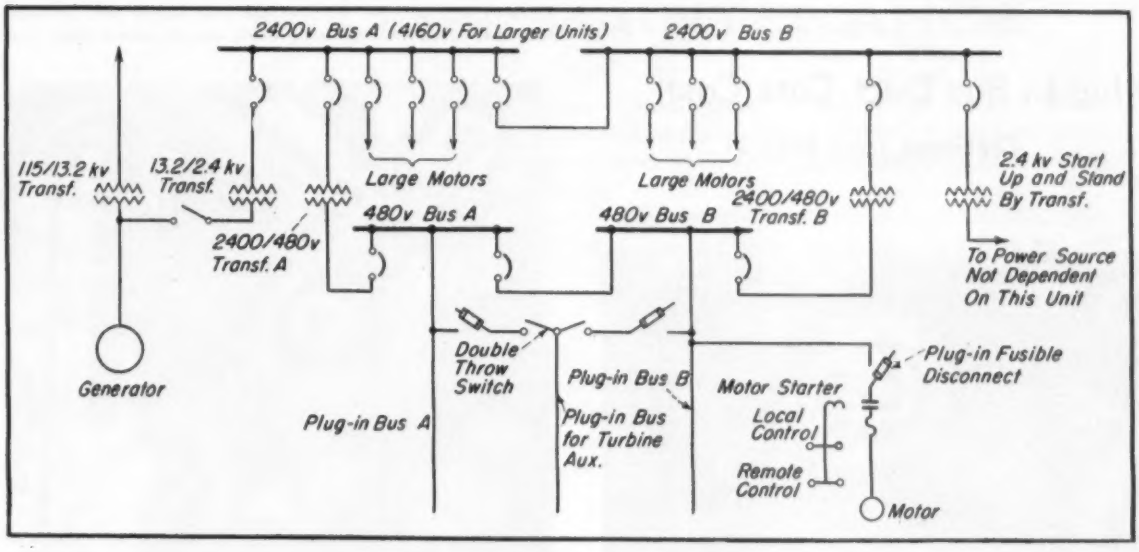
These two runs of plug-in bus are suspended from the ceiling of the plant basement and are about 12 to 15 ft above the floor. They are below most of the piping and are so routed through the plant that very few motors are more than 30 ft from the bus. Because continuous operation is essential, most of the 440-v driven auxiliaries are installed in duplicate. One motor of each of these duplicate pairs is fed from each of the two plug-in bus sections.

Each motor circuit is protected by a cover operated fusible disconnect switch. This disconnect switch is plugged into the bus as near as possible to the motor it is protecting. Standard magnetic motor starters, mounted at or near the motor they control, are used. A selector switch or push button, mounted in the cover of the magnetic starter, provides local control. Remote control, when desired, is obtained by running control cable from the local starter to the remote control station.

Those turbine auxiliary motors that are not supplied in duplicate, such as the emergency oil pump and the turning gear and its oil pump, are connected to a short section of plug-in bus duct. These short bus sections are fed from manually operated double throw switches, each throw of which is fed from one of the main bus runs.

Low First Cost . . . The savings in first cost are due to several reasons. Most of the large 480-v circuit breakers are eliminated. Heavy power cables

Auxiliary one line shows arrangement of plug-in bus



# of Station Auxiliary Switchgear

feeding motor control centers are no longer necessary. The length of practically every 440-v motor feeder is shortened, some by as much as 150 to 200 ft. As control stations are factory wired in the starters, control cable runs from starters to local control stations are eliminated. There is no need to provide spare starters or space for expansion as in a properly designed control center installation. Furthermore individual starters save floor space.

Reduce Maintenance Costs . . . Future maintenance costs and down time should be reduced. Although only years of operating experience will bring out the actual savings, it seems certain that they will be substantial. With this plug-in bus system a motor, its starter, its local control station, and with few exceptions its fuses and disconnect switch are all within sight of each other. All components are usually no more than 10 to 15 ft apart. Thus, maintenance and test work will generally be a one man operation with time spent moving between test points cut to a minimum.

With the control center system a motor's fuse disconnect and starter may be 200 ft away from the motor and its local control station. With this situation every trouble shooting or maintenance job requires two men.

Increased Safety . . . When a motor's disconnect switch is in sight of the motor, a man working on some driven equipment or its motor has complete control of the motor's power circuit. This is better than the best "red tag" system that must be used when the motor and its disconnect are not adjacent.

Add Equipment, Make Changes . . . Although changes to a power plant do not frequently occur, if adding or relocating equipment becomes necessary, it can easily be done with such a flexible power system.

Answers to Objections . . . When this scheme was first proposed to the company's design and operating staffs, only two serious objections were brought forth. These objections and the answers to them are:

As the bus and fuses will be mounted near the ceiling, testing and replacing fuses will require a ladder. Down time will therefore be increased.

This is true. However, when fuses of the correct size are used and properly coordinated with the overload elements in the starters, the fuses will blow only for an actual fault in the motor, starter, or feeder cables. So when fuses do blow, the shutdown will be lengthy, and the time of replacing fuses of little consequence.

As the plug-in bus duct is, in effect, an extension of the switchgear bus, probability of bus faults is greater.

This is probably true to some extent, but the construction of the bus is such that it is probably less subject to faults than the bus work and taps to starters in most control centers. The plug-in bus is definitely less subject to faults than cable runs. If a fault should occur in the plug-in bus duct, it can be repaired very quickly if spare bus material is kept on hand, much quicker than say replacing a 100-ft of 500-MCM cable in conduit.

(*Continued on page* 32)

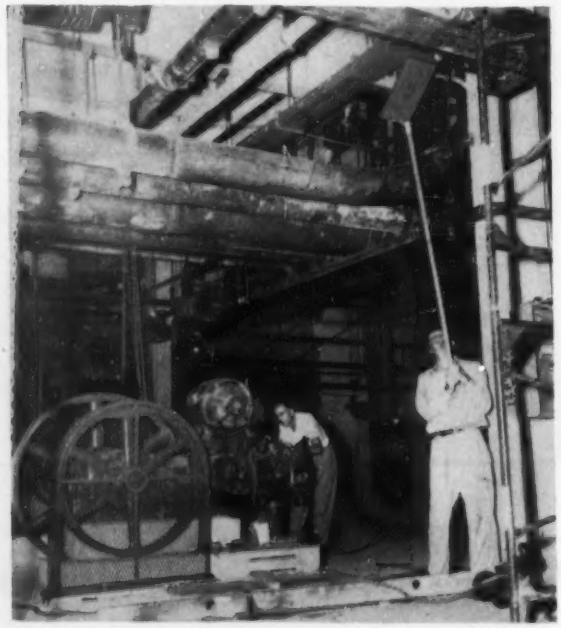
SUWANNEE RIVER STATION

Plug-In Bus Duct Cuts Cost

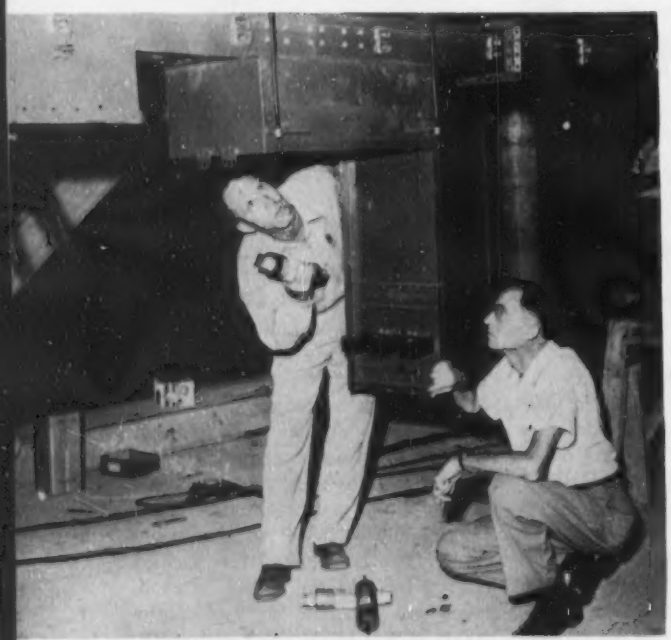
Continued from page 31

PLUG-IN BUS DUCT in the Suwannee River Station does not interfere with generator main leads which are of isolated-phase type

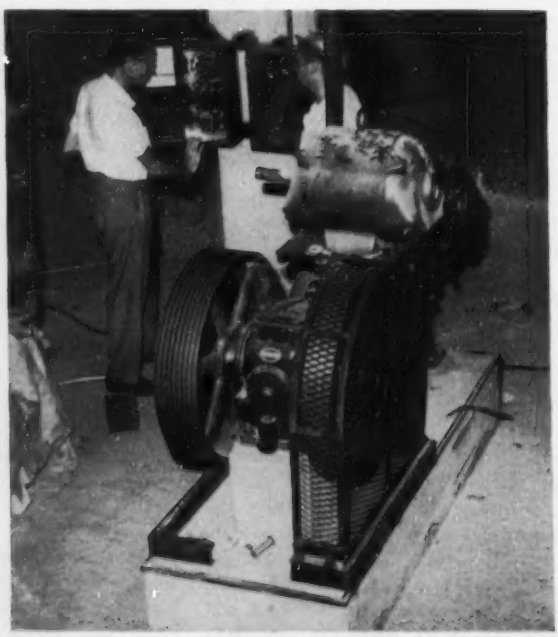
INTERFERENCE with piping and conduits is held to minimum because most plug-in duct is run below them, only 12 to 15 ft above floor



STICK-OPERATED SWITCHES are used when bus duct must be placed high above floor level. This facilitates maintenance and operation



FUSING 400-amp cover operated switch for subfeeder to fuel-oil pumps. Small switch is for subfeeder to traveling screen at intake



STANDARD MAGNETIC STARTER is used with bus duct. Flexibility of the plug-in bus duct permits placing of starter next to motor

Now– new design provides LONGER LIFE... LESS MAINTENANCE

The completely redesigned Westinghouse Pole-Type Transformer line for 1955 features major advances in design which offer you 1) more resistance to corrosion, 2) superior tank sealing, 3) greater simplicity in installing, operating and maintaining.

For instance, the *new high dome cover* with its unique, single, captive retaining bolt eliminates all cover clamps, retaining rings and exposed threads subject to corrosion. This construction provides a superior seal . . . facilitates maintenance and inspection.

Every one of the new features has similar direct, timesaving, money-saving benefits for you.

If you have not yet received all the details of this outstanding new line, call your nearby Westinghouse Representative now—or write direct to Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-70734

YOU CAN BE SURE...IF IT'S Westinghouse

Frank L. Snyder, Westinghouse Vice-President, with four of the transformer types involved in major design improvements.

Helping the industry meet its growing loads

Generator inner-cooling takes the heat out . . . to give you 275,000 kw and above on single shafts

Westinghouse ingenuity blows hydrogen *through* conductors, doubles capability, greatly reduces size and weight.

Generator ratings—and actual turbine-generator capability—have been at least doubled in the last four years, thanks to the successful efforts of Westinghouse engineers and technicians in effectively cooling vital areas. It has proved to be another example of Westinghouse ingenuity, paving the way for ratings never before thought practical—or possible.

Generator inner-cooling represents a tremendous advance in dissipating heat from current-carrying windings. It is sound in concept . . . direct and simple in application. Conventional hydrogen is blown at high velocities through the inside of rotor and stator conductors . . . in intimate contact with the copper where heat is generated. It is the most simple and effective cooling method ever devised.

Already proved in extensive service, this inner-cooling has doubled single-shaft ratings over those attainable using conventional cooling. In the lower ratings, too, there is an appreciable reduction in size and weight.

Westinghouse inner-cooling has become the key to even greater generating capability. Appropriate refinements in coolant flow and pressures—ready to be applied as required—promise a sound and economical method for the large ratings required to meet your ever-increasing loads.

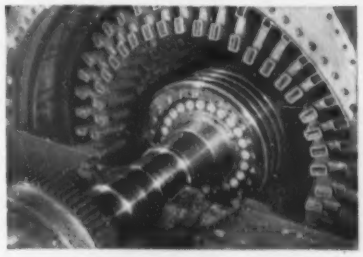
Producing kilowatts at the lowest possible cost is, as always, the moving force behind this singular Westinghouse achievement. It is one of the major reasons why turbine-generator capability has advanced *today* to 275,000 kw on a single shaft and shows real promise of surging to 350,000 kw and beyond within a very short time . . . meeting demands for larger, more efficient units producing more and more kilowatts from given volume and weight. These are Westinghouse answers to producing kilowatts at the lowest possible cost . . . to help the industry meet its growing loads more efficiently, reliably and economically.

J-97182

YOU CAN BE SURE . . . IF IT'S

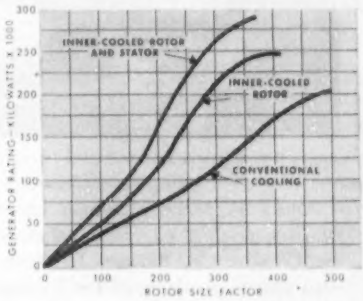
Westinghouse

Inner-cooled Generators



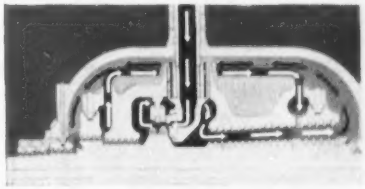
This is an end view showing the stator windings of a 100,000-kw inner-cooled generator. The ducts bring the hydrogen into intimate contact with the conductors, eliminating heat flow paths through the steel and high-voltage insulation.

With inner-cooling, it is possible to build single-shaft, turbine-generator units of much greater capabilities and to reduce the size and weight for smaller ratings.



Westinghouse success and experience with generator inner-cooling give current models a great margin of technical superiority. The chart above shows the extra capability possible through application of this Westinghouse-perfected technique.

Turbine-Generators . . . 275,000 kw and beyond



New turbine technology is equally as dynamic as the generator achievements described here. Mass-flow cooling, to name one, is another technique used by Westinghouse to cool vital areas. Here, cooled, partially expanded steam passes between inner and outer casings. Result: Temperature differentials are greatly reduced; the thinner walled casings adapt quickly to changes in load, starting and stopping. Mass-flow cooling is already being used on a new 275,000-kw super-pressure turbine-generator and will become another major factor in increasing turbine-generator capability to ranges never before thought practical or possible.

Metz Made President of Nema

Board chairman of Okonite Co replaces Jewell as top official of electrical manufacturers association

ALBERT F. METZ

Albert F. Metz, chairman of the board and chief executive officer of the Okonite Co, Passaic, N. J., has been elected president of the National Electrical Manufacturers Association.

Metz, former treasurer of Nema and a member of its board of governors for several years, succeeds J. H. Jewell, vice president in charge of sales for Westinghouse Electric Corp.

Metz's career with Okonite began in 1919 when he started as an accountant. He was named comptroller in 1924, elected a director and treasurer in 1928, and vice president in 1945. He became president of the firm in 1949. He assumed the posts of board chairman and chief executive officer in late 1953.

Metz's Nema Activities . . . His Nema activities include filling the chairmanship of the association's import committee and of the program and budget committee. He is serving on the advisory committee to conference group on co-ordination of electrical industry promotional and sales programs, law committee, and officers committee.

In the past Metz has served on these Nema committees: Safety regulations, tariff and customs, defense production, and project cost allocation formulae.

Metz was chairman and is a member of the association's wire and cable section.

•

Vincent J. Walsh, executive assistant to the secretary of Philadelphia Electric Co, has been elected secretary of the utility. Walsh, with Philadelphia Electric since 1928, succeeds the late Vincent A. Sommar (EW, Nov. 8, p 48).

William B. Elmer has been appointed a member of the Michigan Public Service Commission to fill the unexpired term running to July, 1959, of **John M. Veale,** resigned. Elmer served as assistant counsel to the commission during 1950-1951.

R. E. Johnson has been promoted to industrial development engineer by Toledo Edison Co. He is succeeded as farm sales manager by **V. I. Marvin,** formerly field supervisor in the farm sales department. Johnson was named to the managerial post in 1936.

John Brosius, formerly superintendent of the Leadville Division, has been appointed distribution staff engineer for Public Service Co of Colorado. **Keith Potter** was appointed Leadville superintendent, and **Ralph Hancock** was appointed superintendent of Georgetown, Colo., hydro plant to succeed **William Reichwein,** retired.

Arthur W. Hooper, editor of Electrical Wholesaling, has been named executive director of the National Association of Electrical Distributors to succeed late Charles G. Pyle, who died last July. For the past eight years Hooper has been a member of the editorial staff of Electrical Wholesaling, serving as its editor since 1951.

Howard E. Riordon has been made general manager of the Radio and Television Division of Sylvania Electric Products, Inc, Riordon, who has held executive posts with Sylvania and subsidiary and predecessor companies for the past 23 years, succeeds **John K. McDonough,** who has resigned. Before this appointment, Riordon served in Puerto Rico as president of Sylvania Electric of Puerto Rico, Inc, a subsidiary manufacturing company.

Robert M. Freeman has been named general sales manager of Amplex Corp, Brooklyn, N. Y. Freeman, who joined Amplex in 1953 as its New York sales representative, will now co-ordinate company-distributor sales policy.

Edwin W. Meise, superintendent of residential electric sales for San Diego Gas & Electric Co since 1945, has been made manager of sales. Meise joined San Diego G&E in 1923.

GE Transformer Division Reveals Key Appointments

William S. Ginn has been appointed general manager of General Electric Co's Transformer Division at Pittsfield, Mass. He formerly was general manager of the Power Transformer Department of that division.

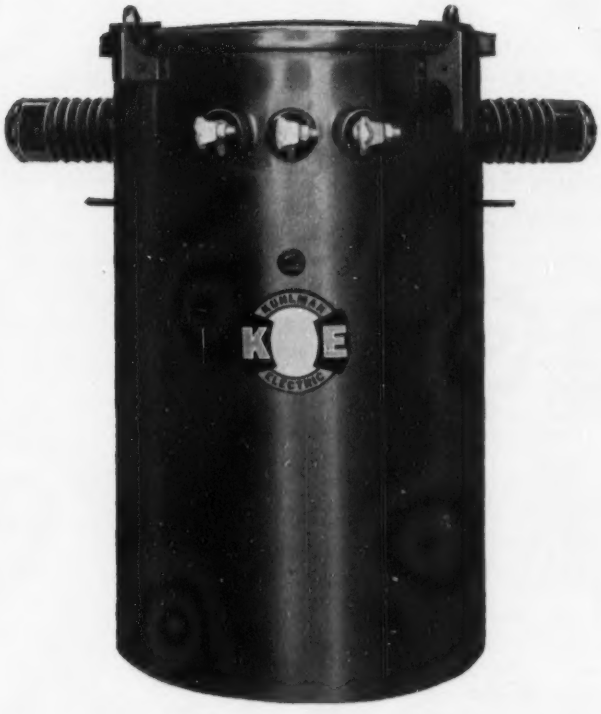
At the same time Ginn's appointment was announced, GE revealed that Francis E. Fairman, Jr, had resigned as vice president and general manager of the Transformer Division. Fairman, a 31-year veteran of GE, has been in ill health for the past year. He will, however, continue to serve the company as a consultant to the division's general manager.

General Manager Ginn has reported that J. W. Seaman has been named general manager of the Power Transformer Department. Seaman's successor as general manager of GE's Locke Department in Baltimore, Md., is Paul R. Hartig. Hartig comes to Locke after serving as manager-employee and plant community relations for GE in the Pittsfield area.

In other Power Transformer Department appointments at Pittsfield, Edward V. Dillon and Robert Bry were named to managerial positions.

Dillon, a former manager of feeder voltage regulator sales, was made manager of marketing administration and personnel development. Bry, who has been a GE traveling specialist for both power transformers and regulators, was named manager-feeder voltage regulator sales.

Kuhlman Distribution Transformers seldom require maintenance



Because of their design and construction, Kuhlman Distribution Transformers help utilities provide a steady and reliable source of power for American homes at a minimum of maintenance. Construction is sturdy and rigid. Tanks are fabricated of heavy gauge high quality steel, tested, and weatherproofed. For voltages through 4800 V., "Quick-Grip" clamp type insulated bushings simplify installation. Tap changer handle extends above oil level so adjustments can be made easily.

The major portion of Kuhlman pole type Distribution Transformers incorporate the well known Bent Iron Core. This core, permitting the flux path to follow the grain of the steel, utilizes the best qualities of cold-rolled oriented silicon steel. Considerable weight savings, reduction in core loss, and low exciting current result.

By achieving balanced design through the Bent Iron Core and other features, Kuhlman Distribution Transformers are engineered to provide exceptionally good voltage maintenance and high efficiency under varying load conditions. Wide oil ducts permit good oil circulation through the windings, maintaining relatively uniform coil temperatures. Kuhlman Transformers, of course, are vacuum treated to insure against trapped air.

Kuhlman Distribution Transformers are available in single and three phase ratings from 3 to 500 KVA. For complete information, write for Bulletins CS 201, CS 202 and CS 203. Kuhlman also manufactures Power, Dry Type, Saf-T-Kuhl, CSP, Subway and Series Street Lighting Transformers. Write for bulletins on these types as well.

152-T

KUHLMAN

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICHIGAN • Southern Division, CRYSTAL SPRINGS, MISSISSIPPI

EXPORT REPRESENTATIVE: INTERNATIONAL STANDARD ELECTRIC CORP., 15TH FLOOR, 50 CHURCH STREET, N. Y. 7, N. Y. CABLE ADDRESS: MICROPHONE, N. Y.

SIXTY YEARS OF PROGRESS IN THE ELECTRICAL INDUSTRY

DAVID E. ALLEN CHARLES H. PORTER MAURICE J. McCARTHY

Anaconda's Key Sales Changes

Wire and cable firm names Allen, Porter, and McCarthy as vice presidents. Department reassignments announced

Anaconda Wire & Cable Co, New York, has appointed three vice presidents and a general manager of its mills, and has made several sales department changes.

New Vice Presidents . . . David E. Allen, formerly general sales manager, was appointed vice president in charge of sales. Charles H. Porter and Maurice J. McCarthy were named commercial vice presidents. Both Porter and McCarthy formerly served as assistant sales managers. **L. R.** Love, formerly vice president in charge of sales, will remain as vice president of the company, acting in an advisory capacity to the officers.

Victor di Lustro was advanced from assistant general manager of mills to general manager of all mills of Anaconda. C. F. Randall, formerly assistant secretary and assistant treasurer, was made manager of production planning.

Sales Dept. Changes . . . In his capacity as vice president of sales, Allen announced the following sales department changes:

New sales manager for the company will be H. V. Van Valkenburg, formerly head of district sales in Chicago. His headquarters will be at the New York offices of the company.

C. B. Peck, Jr, formerly manager of sales of rubber and plastic insulated products, was appointed manager of industrial sales.

J. L. Tindale was named manager of utility sales. Previously he was manager of sales for bare and weatherproof power cable and accessories.

H. E. West, previously manager of industrial promotions, was designated manager of contractor sales and Dan Mancini was appointed administrative assistant.

Commonwealth Edison Co Makes Executive Shifts

Executive changes involving both Commonwealth Edison Co and its gas subsidiary, Northern Illinois Gas Co, have been announced by Willis Gale, chairman of the two companies.

Marvin Chandler was elected president of Northern Illinois Gas Co to succeed H. P. Sedwick, who was named vice chairman. To assume the executive post with the gas company, Chandler resigned as vice president of Reis & Chandler, Inc, New York financial and investment consultants to public utilities. E. D. Sheehan, assistant vice president, was made vice president in direct charge of operations for Northern Illinois.

George W. Ryerson, assistant secretary of Commonwealth Edison was appointed secretary of Northern Illinois. Fred N. Baxter, who has been secretary of both Commonwealth Edison and its gas subsidiary, will relinquish his duties with the latter.

Other changes include the election of William H. Colwell as assistant secretary of Commonwealth Edison to succeed Ryerson. Colwell has been director of publicity for the Public Service Co division of Edison.

Leroy J. Clark, secretary of Chicago District Electric Generating Corp, an Edison subsidiary, was elected, in addition, as an assistant secretary of Edison.

Stephen E. Taylor, who has been in charge of Edison's stock transfer department, was appointed assistant secretary of Northern Illinois Gas. His successor in the Edison stock transfer department will be W. Warren Currier.

William F. Hayes, a specialist in machine accounting for Edison, was made assistant comptroller of the gas company.

OBITUARY

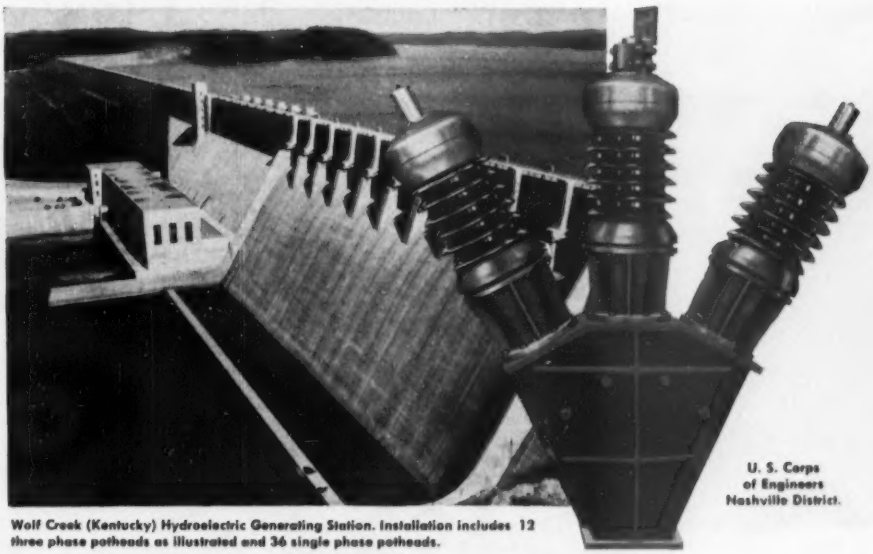
Edward H. Coe, 65, retired president and chairman of the executive committee of Central Arizona Light & Power Co, a predecessor of Arizona Public Service Co, died Oct. 31. Coe joined Central Arizona in 1925 as general manager. He served the utility as president from 1936 to 1946, retiring in 1951 from the chairman's post. Prior to joining Central Arizona he was associated with Public Service Co of Colorado, Niagara, Lockport & Ontario Power Co, and General Electric Co's lamp department.

Augustus P. Lewis, 74, former superintendent of transportation and sales manager for Central Illinois Electric & Gas Co, Rockford, Ill., died Nov. 1 at South Bend, Ind. Lewis, who entered the utility field in 1926, served Central Illinois E&G and predecessor companies in several capacities. At the time of his retirement in 1949, he was serving in the superintendent and sales manager posts. He became a member of the utility's board in 1937, remaining as a director from the time of his retirement until April 1951.

Louis F. Dabe, 60, director of rates valuation of Columbus & Southern Ohio Electric Co, died at Columbus Nov. 3.

Harry C. Foss, retired founder of the Export Division of American Brass Co, died at Waterbury, Conn., Oct. 11. Foss joined American Brass' sales department in 1913. Ten years later he founded the Export Division, retiring in 1944 as its manager.

G&W 26,000 volt
"ATA" POTHEADS
for high pressure oil or gas generator cables



U. S. Corps of Engineers Nashville District.

Wolf Creek (Kentucky) Hydroelectric Generating Station. Installation includes 12 three phase potheads as illustrated and 36 single phase potheads.

High pressure (200 p.s.i.) oil or gas pipe cables for large generator leads have proved quite satisfactory from an engineering and economical standpoint. For terminating such cables, G&W is regularly furnishing Type "ATA" three phase potheads as illustrated for two conductors per phase in sizes up to twin 1750 Mcm. HP oil and twin 1500 Mcm. HP gas.

The oil or gas filled steel pipe enclosing the six paper insulated conductors, is joined to the base of the body, which is reinforced welded steel with non-magnetic steel flanges on top. The highest quality porcelain tubes withstand test pressures considerably in excess of the operating pressure. Non-magnetic stainless steel top caps and bottom sleeves are attached to the gasketed tapered ends of the porcelain tubes by screws threaded into bronze rings cemented to the porcelains.

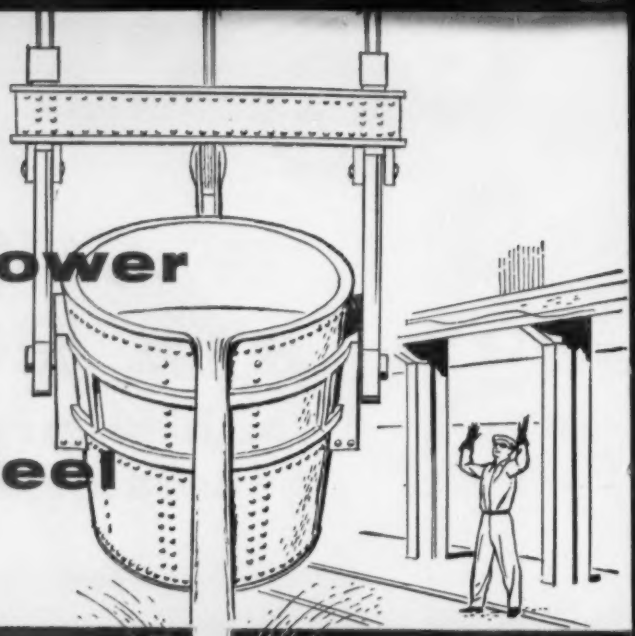
Stress relief cone material and complete installation instructions are included with Type "ATA" potheads. Order direct or through your cable manufacturer.

G & W ELECTRIC SPECIALTY CO.
7780 Dante Avenue, Chicago 19, Illinois

Representatives in principal cities of U.S.A.
In Canada—Powerlite Devices, Ltd., Toronto, Montreal & Vancouver

AT-542

Pouring power into a giant of steel



Dramatic symbol of America's industrial might, U. S. Steel's big Fairless Works is completely new —a giant at birth! From foundations to furnaces, here is an outstanding example of industrial foresight and planning.

Among this huge mill's many impressive innovations is its planned system of power distribution. Substations, switchgear, and circuit breakers—channeling power throughout this giant of steel—are strategically located to provide maximum protection, control, and continuity of service.

Installation of *only the finest* of equipment has been a long tradition at U. S. Steel. Electrical distribution equipment—of fundamental importance—has to be rugged and dependable to fulfill these vital requirements.

at U.S. Steel's new FAIRLESS WORKS

kilowatts for a colossus feed
through switchgear and circuit breakers built by I-T-E

Some 70 modern indoor and outdoor I-T-E Unit Substations transform and distribute power throughout the mill. I-T-E Low-Voltage and Metal-Clad Switchgear, as well as Heavy-Duty I-T-E Circuit Breakers, guard the many critical steel processes.

From the start, I-T-E gave important engineering assistance in the preparation of specifications and in expediting *switchgear* orders for the Fairless Works. As a result of this close cooperation, power distribution equipment was on the ground *when needed* to fit right in with tight construction schedules.

Traditionally a supplier of U. S. Steel, I-T-E is proud of its place as a *major* contributor of quality power distribution equipment for the new Fairless Works.

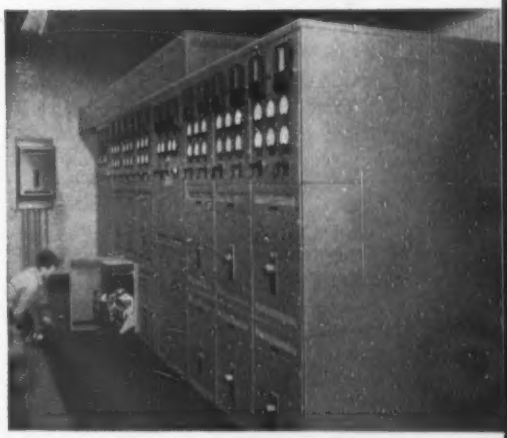
AT FAIRLESS—

I-T-E Switchgear protects:

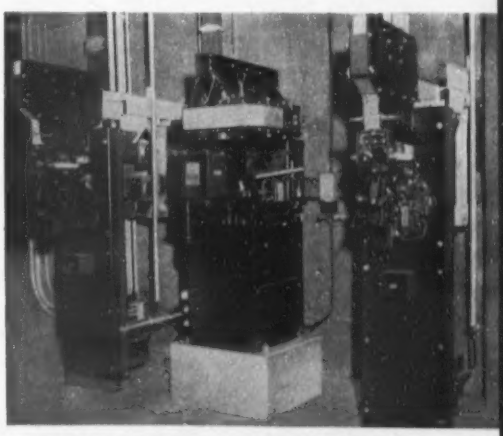
rolling mills	**open hearths**
coke ovens	**maintenance shops**
power house auxiliaries	**office building**
billet mills	**car dumper**
strip mill	**ore dock**
blast furnaces	**oil bulk storage**

For details, contact the I-T-E field office nearest you. Look in your classified directory under "Electric Equipment."

I-T-E METAL-CLAD SWITCHGEAR
installed in cold mill for 2400-volt distribution.



I-T-E LOW-VOLTAGE SWITCHGEAR
installed in sheet and tin mill for 480-volt distribution.



I-T-E HEAVY-DUTY CIRCUIT BREAKERS
Types MT and OH, used for DC sectionalizing in billet mill.

THE SYMBOL OF QUALITY SWITCHGEAR

I-T-E CIRCUIT BREAKER COMPANY

19TH AND HAMILTON STREETS, PHILADELPHIA 30, PA.

SWITCHGEAR PRODUCTS

PIP Survey Notes

Public opinion surveys submitted to PIP members during the workshop conference in St. Louis, Mo., Oct 27-29 covered employee publications, customer relations and other subjects. Prepared by Central Surveys, Inc. for PIP, the surveys made these main points:

Employee Publications . . . Questioned as to the content of company publications, a majority of the employees of the 15 companies covered want to see more space given to:

- Relations with REA co-ops.
- Employee benefit plans.
- What company is doing about threat of government ownership.

A preponderance of the employees in the companies covered believe sufficient space in company publications is given to the following subjects:

- Service to customers.
- Construction programs.
- Company finances.

Other Conclusions . . . Various studies of employee opinion made by Central Surveys and other agencies indicate:

- Utility employees as a group are fairly close to management thinking on questions pertaining directly to the utility industry . . .
- On more general ideological questions, utility employees are clearly to the right of the general public, although this varies on different points. Most utility employees are definitely not collectivists.
- In both respects, the problem is not so much one of "convincing" or "converting" the employees to free enterprise; it is more a matter of developing enough understanding among employees, so that they can be more articulate in defending the economic system they believe in.
- The difference between supervisors and non-supervisors is largely in attitudes, with supervisors usually somewhat further to the right both in general ideology and on industry questions. Supervisors tend to be more positive in their ideological leanings, and fewer of them are in the undecided group.
- There is no single answer to the question of whether to carry on a program of economic information for supervisors only, for all employees, or for the two groups separately. What is best for one company may not be best for another.

PIP WORKSHOP PANELISTS pictured above are Colin W. Raff of Montana Power Co, C. A. Collier of Southern Services Inc, Walter J. Thompson of Niagara Mohawk Power Corp.

Fifth PIP Workshop

Late reports from the nation's major power battle areas were featured in a panel discussion at the recent workshop held in St. Louis Mo., by the Electric Companies Public Information Program.

These reports recounted successes, progress and a few setbacks in the industry's attempts to advance power programs and policies in key regions. Pres. Carl J. Forsberg of Wisconsin Power and Light Co, who moderated the panel discussion, warned that a fight confined to a small area today may in time become the concern of the whole industry.

Two other panel discussions dealt with techniques for telling the industry story to company employees and to outside groups. These panels, moderated by John N. Kerr, Jr. of Public Service Co of Colorado and E. W. Smith of Pennsylvania Power and Light Co, included talks on employee publications, reading racks, community relations and work with special outside groups.

Edwin Vennard, President of Middle West Service Co, pumped for a long-range, person-to-person campaign for getting over the industry story. He urged industry public relations men to supply the facts on such controversial issues as the Tennessee Valley Authority, the preference clause, comprehensive river development, the economics of waterpower development and the tax exemptions of public power enterprises. "We have failed miserably to convince the people of the fraud of TVA," Vennard said.

In a concluding speech appraising the industry's public information activities, Charles E. Ide, President of The Toledo Edison Co., said substantial progress has been made. "But," he continued, 'I have the feeling that in this respect we still aren't taking full advantage of our favorable position. Our performance through the industry is spotty. In too many instances the public relations department is tacked into the company organization as an afterthought instead of being thoroughly integrated as it should be."

Battle Reports . . . From seven areas where the federal-public-private power issues has played a featured role, company executives brought late reports. Following are summaries:

Dixon-Yates In Balance . . . Most of the criticism of the Dixon-Yates proposal for supplying power to the Atomic Energy Commission has been aimed at the Republican Administra-

Carl J. Forsberg of Wisconsin Power and Light Co, Robert F. Ball of Idaho Power Co, F. C. Weiss of Alabama Power Co and Edward Ruisch of Iowa Public Service Co.

Hears Battle Reports

tion rather than at the industry, said Edgar H. Dixon, President of Middle South Utilities Co and a key figure in the negotiations. He noted that Democratic Senators John L. McClellan and William J. Fulbright of Arkansas supported the private power proposal and said election of Democratic majorities in Congress would not necessarily mean a turndown of the contract. If the proposal is given a fair hearing, Dixon predicted the industry will come out of the situation "with a great deal of dignity."

Victory on the Coosa . . . Alabama Power Co will file for a federal license early next year for the first of the new hydroelectric plants to be built on the Coosa River under terms of legislation passed earlier this year. This new development unanimously approved by Congress for private construction will cost $100 million and add another 360,000 kw to the capacity already developed by Alabama Power on the river. F. C. Weiss of Alabama Power told the workshop group that an intensive person-to-person information campaign had paved the way for the enabling legislation and won the near unamimous support of Alabama Congressmen. The bills sailed through Congress.

New Inning for Niagara . . . Battle for private power development at Niagara Falls is not dead, said Walter J. Thompson of Niagara Mohawk Power Corp. "We have just begun to fight." Because legislation permitting electric company development of an additional 1.1 million kw of Niagara power died in Congress, it is necessary for new bills to be introduced. An intensive campaign to inform the public helped the legislation get as far as it did in the present Congress, Thompson said, noting that Gov. Thomas E. Dewey and both New York Senators had opposed the private development bills.

Clark Hill Decision in Air . . . Interior Department may act soon on the marketing of power from the Clark Hill dam to Georgia customers. At present the entire output from this dam is going to South Carolina. Charles A. Collier, formerly of the Georgia Power Co, said the company would deliver power to preference customers but not under the usual wheeling contract. A government proposal for marketing the power in Georgia is opposed by rural electric cooperatives in the state, but no legal alternative is in sight, Collier told the conference.

Progress at Hells Canyon . . . Last of the briefs in the Hells Canyon hearing before the Federal Power Commission are due in January. Idaho Power Co is preparing to begin the three-dam development within 30 days after a license is granted, Robert F. Ball of the Company said in a report to the workshop. Extensive public relations program carried on in connection with this project has reached to every corner of the region, said Ball.

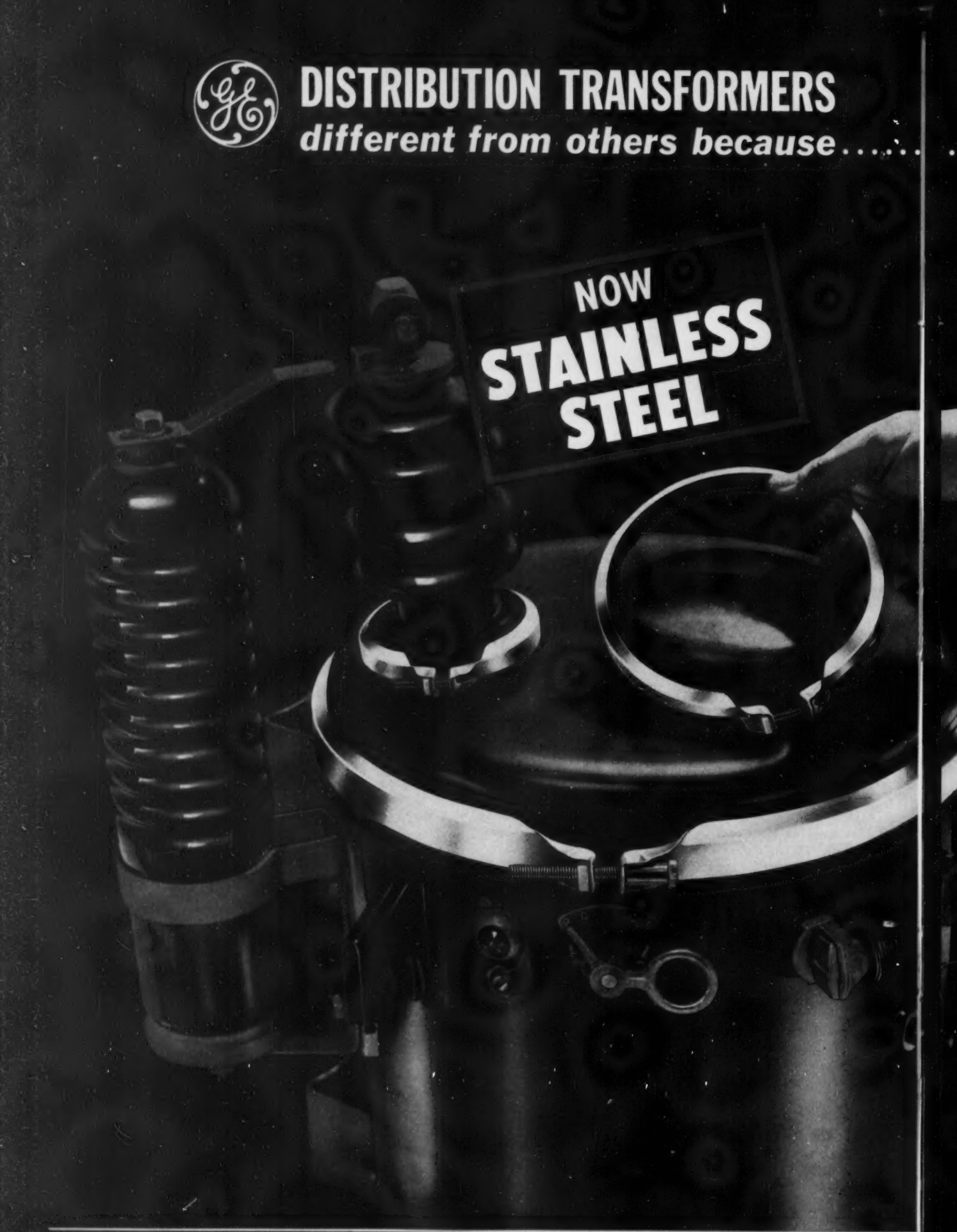
Northwest for Partnership . . . Opinion leaders in the Pacific Northwest strongly support the partnership power development policy of the Eisenhower Administration, Colin W. Raff of Montana Power Co told the Workshop participants. ". . . if the present administration is forced to retreat from its policy . . ., our industry has some tough times ahead," said Raff.

Preference in Missouri Basin . . . "To date, the federal policy has been to bring government power lines only within the borders of the States of Iowa, Minnesota and Nebraska," Edward Ruisch of Iowa Public Service Co told the conference. "Consequently the companies of Iowa have embarked on a 161 kv grid program to interconnect all principal suppliers and to receive and distribute federal hydro power . . ."

NEW WORKSHOP CHAIRMAN R. D. Furber of Northern States Power Co. shakes hands with retiring Chairman H. P. Hoheisel, Oklahoma Gas and Electric Co.

DISTRIBUTION TRANSFORMERS

different from others because.....



....Stainless Steel Clamping Bands

prevent rust and corrosion . . . easy to put on and take off

One-piece cover bands on cover, handhole cover, and bushings of General Electric distribution transformers are easy to remove for inspection or maintenance—and are just as easy to replace. Only a screwdriver is needed to loosen or tighten the one bolt which holds each band in place.

Exerting even pressure on nitrile gaskets, the clamping bands assure an airtight seal. This prevents oil contamination even after years of service and results in longer transformer life.

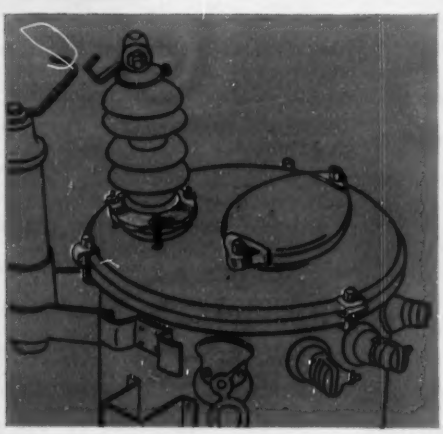
CORROSION IS GREATLY REDUCED by this new G-E design which eliminates bolt clamps and welded projections which can trap moisture and thus cause corrosion. In addition, all G-E bands and bolts (plus Belleville washers on the cover and low-voltage terminal clamps) are made of *stainless steel* to prevent corrosion. (The bands, however, are painted blue-gray to harmonize with the tank.) A coating of Neoprene rubber is vulcanized to the inside of each band to prevent its scratching the tank or cover and starting the corrosion cycle.

REMEMBER . . . all transformers are not alike . . . compare them all and see for yourself why General Electric is your best transformer buy.

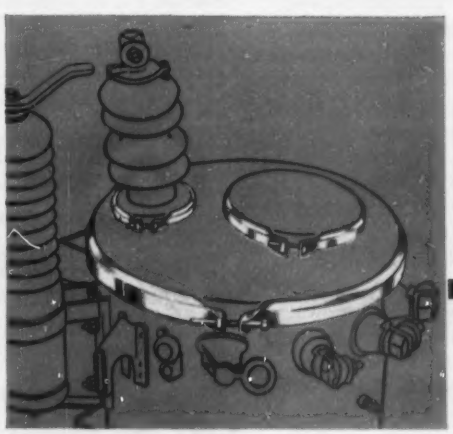
For more information on distribution transformers, either self-protected or conventional, contact your nearest G-E Apparatus sales office or agent, or write to General Electric Company, Section 431-16, Schenectady 5, New York.

Progress Is Our Most Important Product

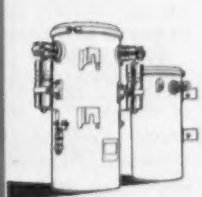
GENERAL ELECTRIC



ORDINARY COVER with bolt-clamps and other projecting surfaces of ordinary carbon steel offers many spots for rust and corrosion to set in.



NEW G-E COVER with its stainless-steel clamping bands has a clean, functional design that gives maximum protection against corrosion.



SELF-PROTECTED CONVENTIONAL

"Take your choice G.E. makes both"

Power Reports Due

Hoover Task Force on Water & Power, Kestnbaum Resources Committee will present findings soon

Critical reports on federal activities in the water resources field can be expected soon from several independent study groups probing these activities at the behest of Congress.

They are:

• Hoover Commission's (Commission on Organization of the Executive Branch of Government) Task Force on Water Resources and Power. This task force has four subcommittees, which are now preparing reports on federal flood control, navigation, power, and reclamation and water supply activities. When these are completed, the task force will present a progress report to the commission. It is hoped this will be done later this month. The task force plans a final report by the end of February.

• Kestnbaum Commission's (Commission on Intergovernmental Relations) Committee on Natural Resources and Conservation. This committee's report, submitted to the commission on Oct. 15, has not yet been made public but it is believed to recommend comprehensive reappraisal of the government's natural resources grant-in-aid programs, and perhaps curtailment of some of these; formation of state-level advisory councils to review federal-state projects; and establishment of a board of coordination and review in the office of the President.

Questionnaires Circulated . . . The Kestnbaum group gathered information on which to base its recommendations through use of questionnaires inquiring as to the desirability of continuing certain federal grant-in-aid programs to the states.

The Hoover Commission's task force held hearings in May and June of this year in New York, Chattanooga, Portland, Denver, and San Francisco, from which they gathered more than 300 statements of interested individuals or organizations.

The power subcommittee of this task force carried this further, gathering data on 100 sample federal-state projects, discussing policies and procedures with the Army Corps of Engineers, Agricultural Department, Federal Power Commission, and Interior Department; visiting federal water projects in California's Central Valley, Lower Colorado Basin, Trinity River, Missouri Basin, Columbia Basin, Tennessee Valley, and south central Florida; and contracting for independent studies by prominent university professors specializing in political science, transportation, agricultural economics, and engineering.

The Hoover task force has a staff of 30 now involved in drawing up the interim report.

Power subcommittee men are: John Jirgal, Chicago financial consultant; A. C. Matti, Honolulu Oil Co; Robert Sawyer, Bend, Ore., publisher; W. D. Shannon, Seattle engineer; C. L. Andrews, Memphis cotton merchant; J. W. Reabis, Cleveland lawyer.

FPC Orders Rehearing on Permit for Wells Site

Federal Power Commission has reopened the Puget Sound Power & Light Co-Douglas County Public Utility District No. 1 dispute over a proposed 588,000-kw hydroelectric site on the Columbia River.

Recently, the commission granted the Douglas County PUD a preliminary permit for the Wells site on the Columbia River in Chelan, Douglas, and Okanogan Counties, on the basis of preference, and rejected Puget Sound Power & Light's request for a similar permit (EW, Oct. 4, p 61). In its latest action, FPC granted a rehearing of these orders. The date for the new hearing will be set at a later time.

MEETINGS CALENDAR

AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Annual Meeting, Statler Hotel, New York, Nov. 28-Dec. 3.

***EDISON ELECTRIC INSTITUTE**
Wiring and Specifications Committee, St. Louis, Nov. 29-30; Prime Movers Committee, Astor Hotel, New York, Nov. 29-30; Commercial Electric Space Heating and Air Conditioning Committee, Cleveland, Dec. 2-3; Street Lighting Committee, Boston, Dec. 7-8; Commercial Cooking and Water Heating Committee, Jefferson Hilton Hotel, St. Louis, Dec. 8-10; Industrial Relations Committee, EEI Headquarters, New York, Dec. 16; Industrial Relations Committee, EEI Headquarters, New York, Jan. 20; Prime Movers Committee, Grand Hotel, Mobile, Ala., Jan. 31-Feb. 1; Home Service Committee, Washington, D. C., Feb. 4-5; Accident Prevention Committee, Shoreham Hotel, Washington, D. C., Feb. 9-10; Transmission and Distribution Committee, Shoreham Hotel, Washington, D. C., Feb. 10-11; Industrial Relations Committee in conjunction with AGA at AMA Mid-Winter Personnel Conference, Palmer House, Chicago, Feb. 14; Electrical Equipment Committee, Deshler Hilton Hotel, Columbus, Ohio, Feb. 14-15; Commercial Electric Space Heating and Air Conditioning Committee, St. Louis, Feb. 17-18; Residential Promotion Committee, New York, Feb. 17-18; Accounting Conference, Planning, Edgewater Beach Hotel, Chicago, Feb. 17-18, 1955.

***1ST INTERNATIONAL AUTOMATION EXPOSITION**
244th Regiment Armory, New York, Nov. 29-Dec. 2.

PUBLIC UTILITIES ADVERTISING ASSOCIATION
Annual Meeting, Region 2, St. Moritz-on-the-Park, New York, Dec. 2-3.

21ST NATIONAL POWER SHOW
Sponsored by American Society of Mechanical Engineers. Commercial Museum, Philadelphia, Dec. 2-7.

INTERSTATE POWER CLUB
Meeting at Hotel Martinique, New York, Dec. 6.

EASTERN JOINT COMPUTER CONFERENCE EXPOSITION
Sponsored jointly by American Institute of Electrical Engineers, Institute of Radio Engineers, and Association for Computing Machinery; Bellevue-Stratford Hotel, Philadelphia, Dec. 8-10.

***NORTHEASTERN WEED CONTROL CONFERENCE**
Annual Meeting, New Yorker Hotel, New York, Jan. 5-7, 1955.

ELECTRICAL EQUIPMENT REPRESENTATIVES ASSOCIATION
Annual Meeting, Breakers, Palm Beach, Fla., Jan. 10-12, 1955.

DOBLE ENGINEERING CONFERENCE
22nd Annual Meeting, Sheraton Plaza Hotel, Boston, Jan. 24-28, 1955.

***PACIFIC COAST ELECTRICAL ASSOCIATION**
Business Development Section, Hotel Californian, Fresno, Calif., Jan. 27-28; Conference on Electronic Integrated Data Processing, Hotel Statler, Los Angeles, Feb. 23-24, 1955.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS
Winter General Meeting, Statler Hotel, New York, Jan. 31-Feb. 4, 1955.

MISSOURI VALLEY ELECTRIC ASSOCIATION
Industrial and Commercial Sales Conference, President Hotel, Kansas City, Mo., Feb. 3-4, 1955.

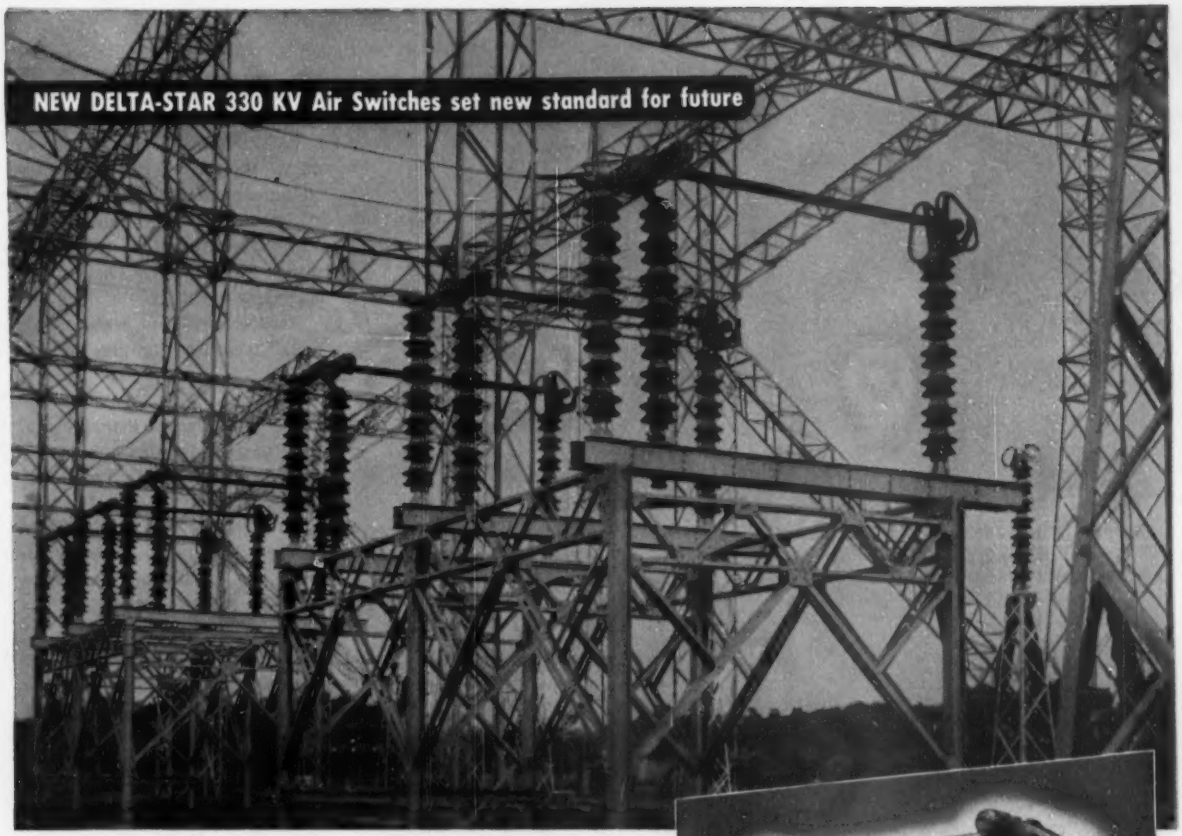
NATIONAL ASSOCIATION OF PURCHASING AGENTS
24th Annual Mid-Winter Conference, Public Utility Buyers' Group, Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

***NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION**
Annual Meeting, Convention Hall, Atlantic City, N. J., Feb. 14-17, 1955.

***PENNSYLVANIA ELECTRIC ASSOCIATION**
Winter Meeting, Electrical Equipment Committee, Benjamin Franklin Hotel, Philadelphia, Feb. 17-18, 1955.

SOUTHERN SAFETY CONFERENCE-EXPOSITION
Jung Hotel, New Orleans, La., Feb. 27-March 1, 1955.

* Additions this week.

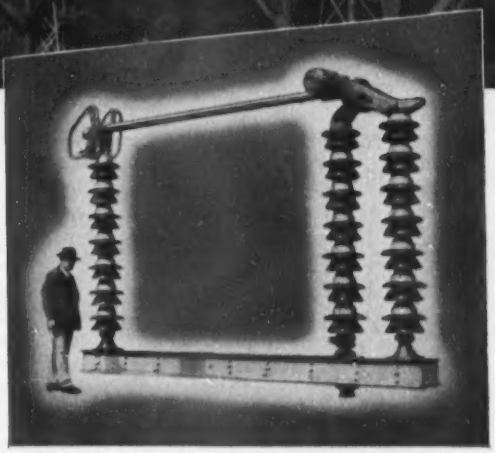


How soon will your future be in this picture?

These new ultra high voltage switches, the first to be ordered and built in this country, are now installed and ready for service. They are the forerunners for handling heavy power loads of the future.

Built along the same basic principles as lower voltage MK-40 switches, which have become the standard of comparison, these 330 kv switches set a new standard for *ultra high voltage* service. They also represent the advantages offered all utilities through DELTA-STAR specialization in carefully engineered, specially designed high voltage switching equipment.

Whether you now need switches of high voltage ratings, high current ratings or normal ratings, your preferred source, more than ever, is DELTA-STAR.



DELTA-STAR 330 kv, 1600 Ampere MK-40 Air Switch

This giant size switch has every feature incorporated in all DELTA-STAR MK-40 switches. Included are rugged high pressure contacts construction and efficiency, simplified blade actuating mechanism, a minimum number of current inter-change surfaces and ease of operation.

DELTA-STAR MK-40 switches are available in voltage ratings from 7.5 to 330 kv, and current ratings from 400 to 5000 amperes.

When you want the best in high voltage switching equipment—specify DELTA-STAR

DELTA-STAR ELECTRIC DIVISION

H. K. PORTER COMPANY, INC.
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DISTRIBUTION PLANNING PANEL leader G.W. Bean, Texas Electric Service, calls on T.E. Mansfield, Central P&L; R.E. Thornton, Oklahoma G&E; R.J. Foley, San Antonio PS Board; and T.D. Thomas, Texas P&L, to discuss future needs of electrical distribution systems

Distribution Men Challenged...

. . . to provide adequate service at a reasonable cost. Texas conference discusses planning for expanded systems of future

Planning the system to make available sufficient electricity where and when required at least cost consistent with adequate service was the challenge of G. W. Bean, Texas Electric Service Co, to his panel at the 7th Annual Distribution Conference. Participants in this panel at Austin, last month, were T. D. Thomas, Texas Power & Light Co; R. E. Thornton, Oklahoma Gas & Electric Co; R. J. Foley, San Antonio Public Service Board, and T. E. Mansfield, Central Power & Light Co.

Load growth at 7% compounded doubles plant investment in 10 years, observed T. D. Thomas. Expenditures must be spread as evenly as possible to maintain a constant revenue to investment ratio. Investors consider 5 to 1 healthy, but great care is needed to maintain this in annual capital additions.

Short-term forecasts are based on 10 to 15% growth, Thomas continued. Generating plant sites and transmission are verified by board studies for lowest overall cost. But distribution comprises 45 to 50% of total plant and must be included in planning "to provide adequate service with smallest expenditure possible."

Look Farther Ahead . . . The more distant future must be reflected in present planning, warned R. E. Thornton. He predicted demands four times those served today and urged that incremental distribution additions be built to serve such loads. Recent experience points to integrated demands of 3 to 5 kw for many residential customers within 5 years, he said, and year-round air conditioning could boost it to 15 kw.

Thornton predicted that future distribution will apply these factors:

1. Subtransmission at 66 to 138 kv.

2. Primary voltages up to 23 kv.

3. Service at 120/240 v except for isolated loads at about 260/448.

4. Elimination of secondary mains.

5. Feeder ratings up to 5,000 to 8,000 kw.

6. Substation capacities tripled or quadrupled.

7. Fused cutouts rated above 10,000 kva.

8. Aluminum and ACSR conductors.

9. Cabled services, secondaries, and primaries.

10. Primary and secondary capacitators.

11. Automatic reclosers on new feeders.

12. Direct-buried distribution.

Typical examples of system planning were presented by R. J. Foley and T. E. Mansfield. Their plans, one municipal, the other private utility, showed agreement in planning ahead to triple present loads. Both use 69 and 138-kv transmission and locate generation well ahead. Distribution is projected by small areas at 13.8 and 12 kv, respectively. And both include personnel training among system needs.

Long Experience Proves Principles . . . Seventeen years' planning experience has molded Dallas Power & Light's distribution system, reported L. J. Blaize. Growth has averaged 17% in recent years, largely because of air conditioning. Expansion has been guided by these three principles:

1. Transmission at 60 kv.

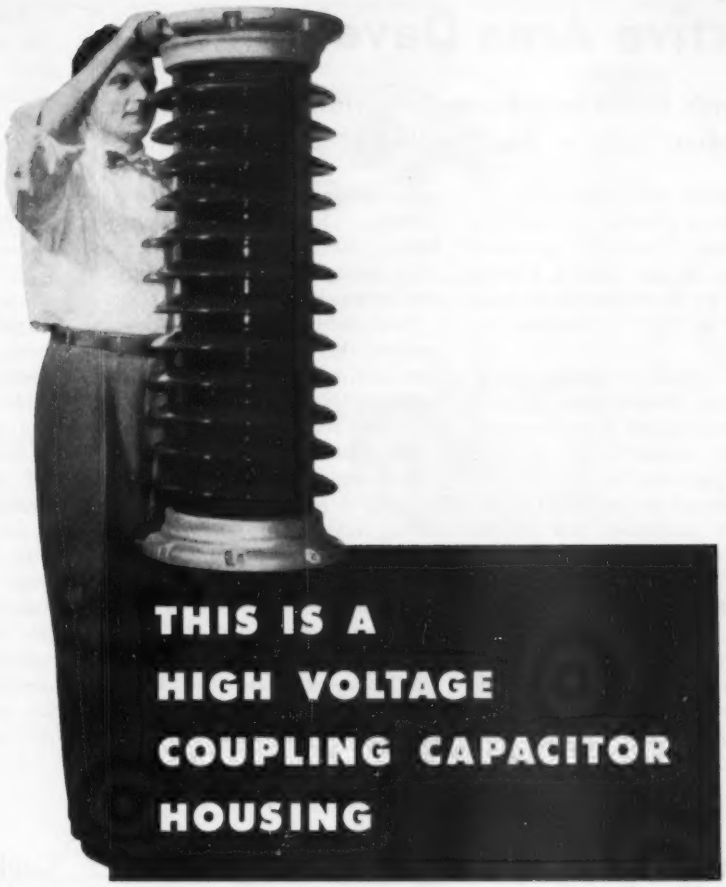
2. Distribution substations of 40 Mva ultimate serving 13-kv feeders.

3. Shunt capacitors to improve system power factor and capacity, reduce system losses, and correct voltage.

Latest figures from EW's distribution survey reveal many changes, reported L. M. Olmsted, associate editor. Distribution is growing so fast that new plant will soon surpass the capacity built in past 75 years. He urged a more comprehensive study of distribution as a whole to provide the economy and reliability which future utility customers will demand.

Basic Research Essential . . . Research into basic problems of the utility industry was urged by Dr J. E. Hobson, Stanford Research Institute. Industrial civilization is consuming natural stored energy at an alarming rate, he warned. When it is gone, the sun remains as "our primary source of energy."

Other speakers surveyed the design and use of mobile substations, application and experience with switched primary capacitors, and transformer installations for a 3-phase-delta service. Manufacturers' engineers reviewed lightning protection for distribution equipment and compared various methods for regulating voltage. And industrial electrical system problems rounded out the three-day conference sponsored by University of Texas' Electrical Engineering Department.



THIS IS A HIGH VOLTAGE COUPLING CAPACITOR HOUSING

This porcelain piece is 15½″ in diameter, 44″ long; its ends are ground for dimensional accuracy and to provide a seat for gasketing. It encloses a condenser element, which, after sealing, is subjected to high vacuum treatment under temperature, after which the entire unit is filled with insulating oil.

This design represents a complete solution to a problem of peculiar difficulty. Primary requirement is a certain and permanent seal, which must be maintained, without leaking or breathing, through years of operation, and despite any forces such as thermal change and wind-loading. And this requirement cannot be met by conventional means such as are generally used in sealing bushings, where an end-to-end conductor provides a mechanical support for spring-loaded end seals. Nor were any of the non-conductive materials which might be used for this purpose considered satisfactory, because of the possibility of stretching.

For a solution to this problem, Lapp's engineering advice was sought—and accepted. As worked out, the seal is maintained by spring tightness on gaskets at both ends. But the novelty of the design is in the fact that the loading is *locally* applied—by bolting to flanges which are cemented to the porcelain.

Only a thorough knowledge of porcelain, its virtues and its strengths, as well as its limitations, would justify suggestion of a design like this, with confidence of success. That knowledge of porcelain is possessed by Lapp. And, at Lapp it is matched by equal knowledge of manufacturing techniques, methods and controls which assure uniform, economical production. These are the facilities back of our claim for all Lapp insulators and special porcelain parts . . . an extra margin of electrical and mechanical operating security . . . long life . . . low upkeep.

Lapp Insulator Co., Inc., LeRoy, N. Y.

Lapp

Effective Area Development...

. . . depends on salesmanship and cooperation, EEI workshop is told. Lindseth explains job Cleveland EI is doing

Salesmanship and cooperation are necessary in an effective area development program. This is what the speakers stressed at the Edison Electric Institute Area Development Committee Workshop held in Cleveland recently.

Elmer Lindseth, president, Cleveland Electric Illuminating Co, said that "we are engaged in salesmanship on the very highest level. We are selling our particular areas to business and industry and our particular industry to our customers and to the American people."

Area Development Objective . . . In striving for area development objective, he continued, we can learn a lot from our industry's other successful selling operations. In this work the utility business needs the efforts of every responsible segment of the community. Chambers of Commerce, banks, railroads, newspapers, and other enterprises must be enlisted in any campaign, he declared.

New industry and industrial expansion, the Cleveland Electric president said, will build "load, but simultaneously they build the prosperity of the entire community."

He pointed out that every 1,000 jobs created in industry will produce:

1. 1,150 jobs in service and supporting industries.

2. A market for 700 dwelling units.

3. Purchasers for the output of 250 farm workers.

4. Customers enough to support 40 new retail merchants.

5. Increased state tax revenue, through sales tax alone, of more than $100,000.

Laurence H. Lang, Cragin, Lang, Fee & Co, Cleveland, suggested that area development departments of electric utilities should work closely with The Society of Industrial Realtors in the various areas. This, he said, will develop team work which can't help but benefit both.

Government Participation Necessary . . . To make any progress in area development, local government participation is one of the first requirements, John R. Frederick, Wisconsin Power & Light Co, told the workshop.

He said that without this participation "other efforts are almost sure to be mediocre, fruitless, and probably fail. So, it is our job as area development people to do a selling job so as to obtain government participation."

In a community development program, Clifton E. Rodgers, planning consultant, Harrisburg, pointed out, "No longer can you think in terms of individual parcels of land, but you must think in terms of areas, residential, commercial, agricultural, industrial, park and recreational."

Load Studies Available To AEIC Non-Members

This year, for the first time, qualifying non-member companies will be able to get copies of the Association of Edison Illuminating Companies' "Report of the Load Research Committee." The report, normally issued once a year, is a study of the characteristics of various loads caused by residential and commercial customers.

As to who qualifies Robert Gale, AEIC secretary made this announcement:

"The Annual and/or Supplementary Reports of the Load Research Committee of the AEIC, when printed and released by the AEIC Headquarters, will be made available to, and upon request by, private electric utilities, either directly or through their Utility Service Organizations, operating within the boundaries of the United States, where such utilities indicate they are engaged in, or are about to undertake load research activities, and indicate a willingness to make available to the Load Research Committee of the Association for its consideration and/or inclusion in its reports, such material and results as may be secured by them through their load research activities."

The report will be available to nonmember companies meeting the qualifications at $10 for the first copy and $5 for each additional copy. Address orders to Mr. Gale, Secretary, Association of Edison Illuminating Companies, 51 E. 42nd St., New York 17, N. Y.

DOD Approves Voting On Letter Ballots

The Department of Defense has authorized the representatives of the military to vote on letter ballots which may be issued in connection with the work of technical societies and related organizations. This information was received in late October by Robert J. Painter, executive secretary of American Society for Testing Materials, and passed along to committee heads.

Voting on technical committees was authorized by DOD Directive No. 5500.2. This directive does not bind the Military departments to participate or to vote, but it is now permissive to do so, stated Mr. Painter.

'Look' Offers Trophy for Wiring Promotion

Contest to promote adequate wiring is being sponsored by Look Magazine in connection with an article in its Nov. 2 issue.

The electric company judged most effective in alerting its community to the need for adequate wiring will be presented a "Community Service Award," which will be a gold trophy.

The Look article, "Watch Your Wiring" is a three-page feature dramatizing the expanded use of home electrical appliances during the past 15 years. Reprints and blow-up posters of the articles are available for use in adequate wiring and merchandising promotion campaigns.

Judging in the adequate wiring contest will be based on presentations sent to Look showing (1) how well the utility company is developing consumer appreciation of the need for adequate wiring, and (2) how well the Look article was utilized to implement the company's campaign.

These presentations or reports can include listings of campaign activities, tie-in newspaper ads, pictures of displays and similar material.

even in
an age of speed...
sheer velocity is not
always an asset...

...in fact
there are some
instances...

...where it's
a real
liability!

take low disc speed in a meter . . .

Speed is definitely not an asset in the turning rate of a watt-hour meter disk.

That's why the disk in the Sangamo J2 Watthour Meter revolves at a low, low rate of speed—only 10 revolutions per minute at the nameplate rating of 15 amperes. And only 66⅔ revolutions per minute or approximately one revolution a second when the J2 is busy measuring a full load of 100 amperes. Yet the J2 has exceptionally high driving power.

This means the Sangamo J2 lasts longer and requires less maintenance than ordinary meters . . . there's less wear on all moving parts.

It means good public relations, too. Mr. Customer doesn't like to see his meter spin.

A METER WITH STRAIGHT LINE ACCURACY

UP TO 100 AMPERES

SANGAMO
ELECTRIC COMPANY
SPRINGFIELD, ILLINOIS

JM54-10

Enrollees discuss the operation of an ammeter at . . .

New York State E&G's Course

Reflecting exceptional employee interest with a company-wide enrollment totaling 1,564 employees, the Electric Demonstration Course of the New York State Electric & Gas Corp, has been completed in each of its six divisions in a little more than a year.

Equally impressive was the fact that 1,213 of the 1,564 employees, or 77% of the total, completed the course. Each of the "graduates" was awarded a Certificate of Attendance.

Course on a Voluntary Basis . . . Enrollment in the course, open to all male employees, was on a voluntary basis, with six two-hour night classes comprising the course. Award of the certificate was based on attendance at five of the six classes.

Because of the heavy enrollment, more than 40 classes were held in the six divisions with each class limited to 30 employees.

The two instructors, who offered their time and experience on a voluntary basis, were:

George H. Pash, Binghamton, safety assistant of the New York State E&G's personnel and safety department, and Leon A. Wheaton, Hornell district utility construction and maintenance foreman of the company.

Employees Went Miles to Attend . . . A definite barometer of employee interest in the course was the fact that numerous employees drove six round trips of 80 to 130 miles to participate in the classes. Included was a group of eight Granville, N. Y., employees who made six 130-mile round trips to attend classes at Wynantskill, N. Y.

Subjects covered in the course included:

1. Universal electrical concepts by providing visual proof of how they work.

2. Pattern or method for solving problems in electrical circuits.

3. Purpose, functioning, care and hazards of common devices such as batteries, transformers, regulators.

4. Use of instruments such as voltmeter, wattmeter, ammeter, ohmmeter, phase meter.

5. Interpretation of symbols and terms of the trade.

6. Discussion of individual technical problems, following the regular sessions.

Philadelphia Electric Workers Reject IBEW

A group of Philadelphia Electric Co production and maintenance employees at nine locations has rejected the International Brotherhood of Electrical Workers-AFL as its representative for purposes of collective bargaining.

Bennet F. Schauffler, regional director of the National Labor Relations Board, under whose direction the poll was conducted, announced that 1,034 of 1,075 eligibles voted. A total of 342 favored the union and 635 voted against it, he stated. There were 54 ballots challenged, while three others were voided in the official count, he added.

Sacramento MUD Wages Up

The Sacramento, Calif., Municipal Utility District board of directors has voted an increase of pay for some 635 workers.

A 2.8% raise was given to all monthly employees, generally, office workers and engineering and professional administrative personnel and the same increase was provided for all classifications in the physical force below journeymen.

A 10¢ an Hour Increase Given . . . In the physical force classification journeymen linemen and electrician and above, including light crew foremen, troublemen and cable splicers, a 10¢ an hour raise was provided. The raise makes the journeymen linemen salary scale $2.52½ an hour.

Increases also were made for shift differentials. For those reporting to work after 12 o'clock noon but before 8 pm premium pay was raised from 4¢ to 6¢ an hour and those reporting for work between 8 pm and 4 am the premium pay was raised fom 6¢ to 9¢ an hour.

Raise Given After Survey . . . James E. McCaffrey, chief engineer and general manager, said the new schedule was arrived at after SMUD officials surveyed the pay of 26 other utilities, both public and private, in the state.

McCaffrey, a $27,500 a year man, was not included in the raise action.

SO MUCH
FROM SO LITTLE

You're looking at a kilowatt-hour* of electricity in its raw state — coal. This lump of coal weighs only 12 ounces. Not too long ago, the amount of coal required to produce a single kilowatt-hour of electricity was considerably larger and weighed 5 pounds. The difference between yesterday's 5 pounds and today's 12 ounces lies in improved steam technology, in better boilers — operating at higher pressures and temperatures — to make the steam that spins the turbines to make electric power.

Impressive as this progress appears, it represents only the current level of accomplishment in the quest for more and still more efficiency. Thanks to America's power engineers, continuing advances in the fields of metallurgy, combustion and design will make it possible to squeeze even more energy from a lump of coal.

*A kilowatt hour will give you the power for, among other things, 10 solid hours of radio and recorded music, 14 hours of fan-cooling, better than 4½ hours of refrigerator operation.

BABCOCK & WILCOX
BOILER DIVISION

N-189

HARLLEE BRANCH, JR., SEE president delivered address. Listening are J. S. Gracey, G. C. Rawls, Thomas Fulford, W. M. Shepherd who also appeared on program

Whither The Summer Peak?

Southeastern Electric Exchange takes up problem at New Orleans Conference as it seeks to "Sell And Thrive in '55"

That newest phenomena of the electric industry—the summer load peak—was in for some pointed talk at Southeastern Electric Exchange's 22nd General Sales Conference in New Orleans late last month.

Utility sales executives and staff men heard speakers espouse hard, intelligent selling as the best toehold for scaling the summer peak problem. And as the conference theme, "Sell and Thrive in '55," was carried through, all talk seemed to end up on familiar ground: air conditioning, electric space heating, the heat pump and adequate wiring.

SEE Pres Harllee Branch, Jr, Georgia Power Co chief, told them it was industrial team work, operating in an unfettered economy that made possible the American achievement being honored today on Light's Diamond Jubilee. Taking their lead from this, the conferees embarked on some teamwork-like idea exchanging of their own.

What Are The Answers? . . . Obtaining the year-round air-conditioning business, said G. W. Cheatham of Alabama Power Co, offers a reasonable answer to the problem of off-setting summer peaks. The heat pump is superior, he said, but until its broader market is established, electric space heating affords a good alternative. However, he cautioned his listeners to prepare now for a controlled expansion of its growth in order to make it a desirable addition and not a liability.

E. N. Avegno of New Orleans Public Service Inc also encouraged year-round air conditioning. His suggestions: get customers to equip room conditioners with resistance heaters or install reverse cycle units; get dealers to promote the ¾-ton or larger, 240-v models; and continue to encourage manufacturers to improve power factors (as most of them will do by 1956).

Electric water heating also was offered as an offset to air conditioning by General Electric Co's George T. Bogard. "The heater peaks in the morning," he said, "the air conditioner in the afternoon. If the industry would standardize on a smaller capacity unit with a more rapid recovery rate, production costs could be lowered and lower cost to the consumer would result."

M. S. Angier of Westinghouse Electric Corp, asked utilities to energetically promote the heat pump. Acceptance would be enhanced, he said, if utilities would provide prospective customers with engineering service as to proper size of the heat pump and the minimum specifications for wiring and duct and house insulation.

In describing sales opportunities for valley filling, J. H. Coates, Ebasco Services, Inc, urged salesmen to watch seasonal, monthly, daily and regional load curves as well as yearly ones, and to use the various selling methods open to off-peak valley filling. Load factors vary even in different service areas of the same company, he said.

Customer, Dealer Relations . . . G. C. Rawls, Louisiana Power & Light Co vice president, said future growth and "just getting people connected up", is going to bring a myriad of problems in building and keeping customer good will. "It isn't inanimate objects, things like generators and transformers, that give us problems," he contended. "It's people." He listed these ways to build customer relations: get the goodwill of your employees first; be prepared to handle customer "incidents" or complaints no matter how small; maintain sound policies and make sure employees and customers understand them.

Much the same applied in presenting utility programs to dealers, claimed R. T. Nash of Central Louisiana Electric Co. "Tell dealers the truth and sell them the truth. If programs are fair and equitable, dealers will buy them."

J. Stanford Smith, General Electric Co, declared "public relations plan-

ning must match the daring long-range programs being made by engineers and management." This is necessary to meet the problem of highly centralized government, confiscatory taxation, politically powerful labor, and the fear of big business.

"We Need 200 Amps" . . . Adequate wiring, true to usual conference form, also was in for its share of discussion. "In the year ahead the National Electric Contractors Association will sit down with utilities to assist them in their adequate wiring efforts," said NECA's Howard Farley. "The public looks to the utilities for guidance in electrical matters, and we as contractors earnestly seek your cooperation. We talk today of a 100 amp service entrance, but already it is inadequate. We need 200 amps."

Reporting on Alabama Power Co's wiring finance plan, W. S. Seale said that in a seven-week period the company had financed 75 jobs totaling $8,898, averaging $118 per job. Adopting a company plan instead of relying on FHA Title I results in less red tape and better promotion, he declared. Duke Power Co's M. T. Geddings stated that demonstrations before rural groups is helping to improve wiring on farms in his company's service area.

Three Point Commercial Program . . . Developing a productive commercial market, Joe B. Browder, Georgia Power Co, told commercial salesmen must start with top management. Next item of importance is a rate schedule that does not discourage use of electricity. And finally there should be a well organized department consisting of one field man for every 1,500 to 2,000 commercial meters.

PRES GEORGE S. DINWIDDIE of New Orleans Public Service, Inc gave convention welcome. At Speakers' table is GE's W. V. O'Brien, right, and C. L. Osterberger of Louisiana P&L

Owen G. Floyd, Gulf States Utilities Co, reported his company anticipates the addition of more than 3,500 kw in electric cooking load this year. Major points required for a successful promotion of electric cooking are servicing of equipment, good reliable dealers, complete support from top management and cooperation of architects and engineers, he said.

More Industrial Promotion . . . In industry, continued and intensive sales and promotion efforts for electrification are required if industrial power sales are to increase by the predicted 172 billion kwhr in the next ten years, declared F. W. McChesney, General Electric Co. Programs through which American industry will achieve greater production per worker are modernization of plants, extension of electrical applications to new and old plants, and continuous automatic production.

On the farm sales front, Bud S. Moss of Georgia Power urged stepped up agricultural development activities, by saying "the more we help the farmer, the more money he will make; the more he makes the more electricity he uses." Edison Electric Institute's Harold Beaty pointed to the loadbuilding potentialities in EEI's current farm lighting promotion and Roy J. McCraney of Georgia Power, finding it impossible to contact all farmers individually, told how he gets added farm sales by letting others (local managers, county agents, meter readers, etc) refer prospects to him. Others spoke on farm applications.

Five Years From Now . . . As to the future outlook, GE Vice Pres W. V. O'Brien predicted that new appliances sold in the next five years would require an additional 20 million kw to operate them. He said more than seven million new electric ranges will be added to existing residential load in the same period, increasing this demand by five million kw.

Roger H. Bolin of Westinghouse declared the industry could sell 428 million appliances in the next five years, but "it will take adequate wiring and adequate selling to do it." He suggested that greater loads could be had by wider utility use of mass demonstrations to sell full use of the appliances people buy. A recent survey showed 50% of homemaker' interviewed didn't make use of the automatic features on their ranges.

Optimism likewise was expressed by four utility sales executives in outlining their sales plans for 1955. But all made clear the need for harder selling. The men: J. S. Gracey, Florida Power Corp; Fay Pierce, Georgia Power Co, Henry Keogh, Florida Power & Light Co; and E. A. Wilson, Alabama Power Co. Wilson announced Alabama next year will conduct a continuous sales training program under a full-time instructor. Pierce said Georgia Power would continue to plug the heat pump.

Commented both Florida Power Corp's Gracey and Hotpoint Co's J. F. McDaniel as the three-day conference came to a close: "We've got to sell and thrive in '55 or we'll be in a heck of a fix in '56."

No one offered them an argument.

LIVELY DISCUSSION marked meetings by Industrial, Commercial, Farm, Residential and Advertising sections day before SEE's general sessions opened. This is Commercial section

One Regulator-

5 RATINGS

Vari-Amp feature on single-phase power regulators provides flexibility for system growth

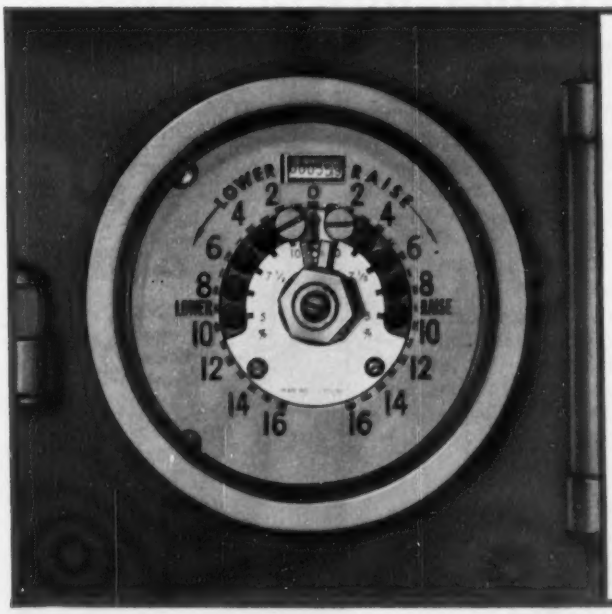
YOU GET FIVE CURRENT RATINGS and five ranges of regulation on a single Allis-Chalmers single-phase power regulator equipped with the *Vari-Amp* feature. Here's an example: a 200-amp single-phase power regulator can be operated at any of the following ratings:

200 amps—20% range **267 amps—15% range**
229 amps—17½% range **320 amps—12½% range**
400 amps—10% range

This means initial cost can be reduced in most cases. And, when loads increase, you can decrease range of regulation in proportion — instead of slicing ranges in half, as with all other regulators. Extra short-circuit capacity is available, too.

The *Vari-Amp* feature also permits unequal range of operation. Under certain conditions you can get full 10% buck even at the higher ratings. It will pay you to get all the facts. Consult your nearby Allis-Chalmers office or write Allis-Chalmers, Milwaukee 1, Wis., for Bulletin 01B6065C.

A-4459



It's This Easy to Change Ratings

3 Simple Steps!

1 **OPEN INDICATOR WINDOW**

2 **PLACE LIMIT SWITCH PINS IN DESIRED POSITIONS**

3 **CLOSE INDICATOR WINDOW**

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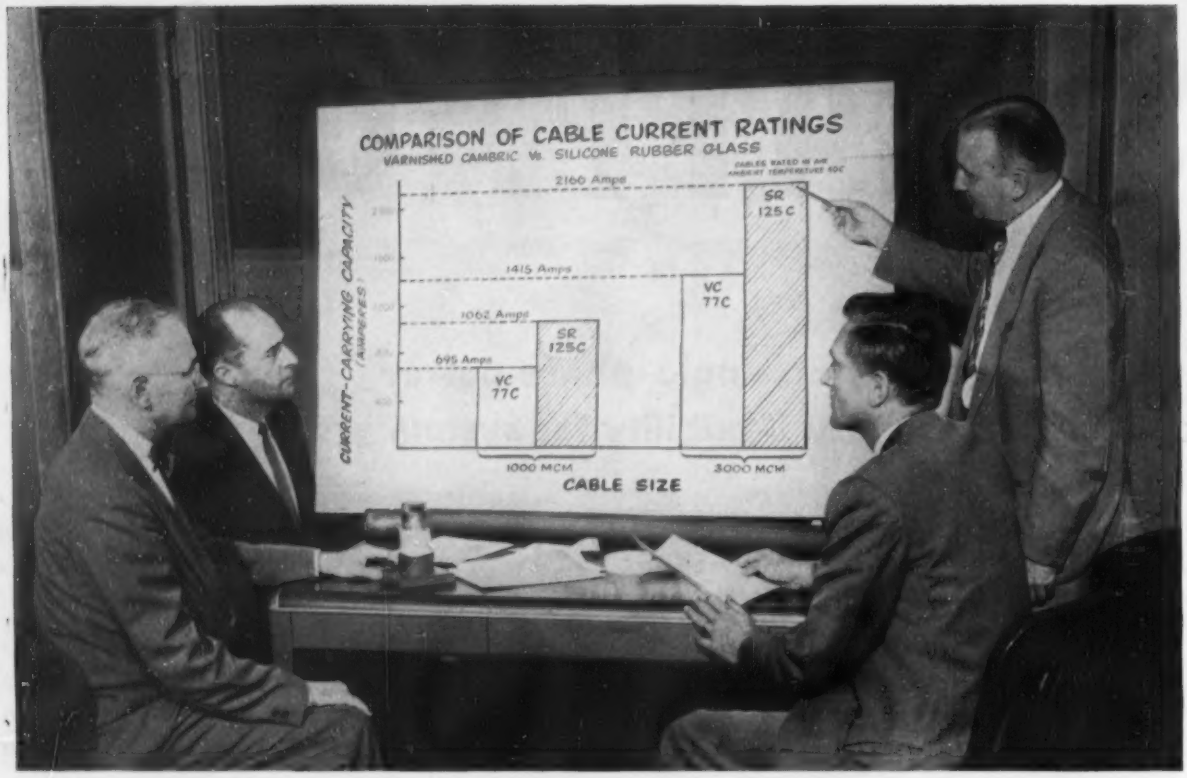
Originators of ⅝% Step Regulation

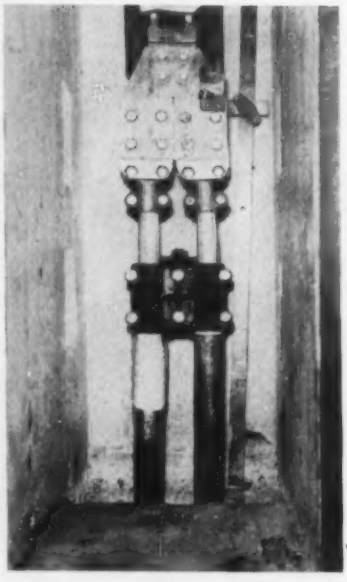


Greater loads can be carried by new G-E silicone-rubber power cable

The latest development in high-temperature silicone-rubber-insulated cable by General Electric engineers offers many important advantages to cable users. It provides for smaller conductors for a given load, greater loads in the same size conductors, and greater freedom from space limitations when compared to conventional cables now available. The unique design, utilizing glass tapes coated with GE SE-100 silicone rubber as insulation, results in a cable rated 125 C conductor temperature for voltages normally encountered in generating stations, substations, and industrial plants.

The first installation of this new silicone-rubber-insulated cable was made at Con Edison's Hell Gate generating station. Generator leads of greater capacity were needed at this station but, due to space limitations, larger cables could not be installed. Working closely with Con Edison personnel, G-E wire and cable engineers solved the problem by designing and supplying this new cable which is capable of carrying increased loads with no increase in cable size. General Electric silicone-rubber-insulated generator leads are now capable of handling increased loads; alterations to buildings and ductwork were unnecessary.

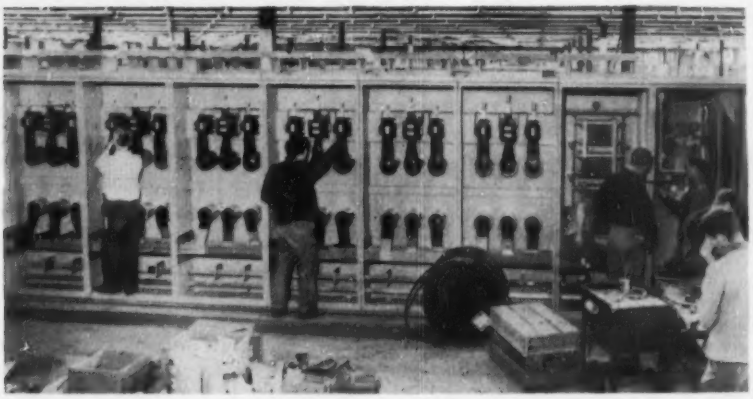
This important development and its successful installation demonstrate General Electric's ability to solve unique and difficult cable problems. Familiar with cable operating problems, General Electric wire and cable engineers are ready to help you solve your cable application problems. Write Section W144-1127, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.



Termination of 2500 MCM, 15 KV silicone-rubber-insulated cable in Con Edison's Hell Gate generating station, stress cone completed on cable at left, in process on cable at right.

Progress Is Our Most Important Product

GENERAL ELECTRIC



Federal Pacific Opened Scranton Plant

Federal Pacific Electric Co, Newark, N. J., officially opened its new Scranton, Pa., plant on Nov. 12. Open house and special tours were included in the opening ceremonies. President John A. Thompson presided. The plant costing $2 million is headquarters of Federal's newly organized Eastern Switchgear Div, the third such division created to handle expanding manufacturing and sales activities. E. A. Williams was recently appointed the division manager. The plant has been in limited production for several months.

Assembled switchgear, the primary product at Scranton, fills the gap between two previous product lines: High voltage outdoor equipment for electric utilities and low-voltage equipment for home and commercial use. Thomas M. Cole, executive vice president, said that the assembled switchgear is designed to meet the heavy-duty needs of large industrial plants, large buildings, and institutions.

Two lines of switchgear are made at Scranton: Low voltage high capacity switchgear is based on the DMB breaker; and high-voltage switchgear is based on the DST breaker. These two air circuit breakers were originally designed and tested in France and further developed by Federal. They are used in metal-clad drawout switchgear such as illustrated above (rear view shown).

In addition, this plant will soon begin production of Pacific's high voltage outdoor switchgear, together with transformers now made in California by Gardner Electric Co, a wholly owned subsidiary (EW, Oct. 4, p133).

The plant is situated on a 28 acre tract, and provides four acres of manufacturing space under roof. An adjacent research and administration building contains 30,000 sq ft. Facilities include its own railroad siding, and indoor shipping and receiving docks. Two electric cranes facilitate both loading and construction in the 45-ft high erecting bay.

Federal expects sales in the near future to double this year's high of $34 million. The company now has 10 plants located in major industrial centers.

Federal Pacific is now completing its $2 million order for the Atomic Energy Commission project at Portsmouth, Ohio. This was one third of the largest order ever placed for this type of equipment. All equipment for this order was subject to exhaustive tests to meet AEC requirements. Federal shared equally in this order with General Electric Co and Westinghouse Electric Corp, it is reported.

Automation Show

First International Automation Exposition will be held Nov. 29-Dec. 2 at the 244th Regiment Armory, 125 W. 14 St, New York City. It offers top management, engineering, and production executives an opportunity to acquaint themselves with advanced mechanization and automatic control techniques in the manufacturing industries.

More than 70 exhibitors will show their newest equipment and techniques for manufacturing methods.

Six computer manufacturers are conducting a computer clinic in conjunction with the show.

Further details may be obtained from Richard Rimbach Associates, 845 Ridge Ave, Pittsburgh 12, Pa.

GE Reveals Polyex For Motor Insulation

A new coil insulation will soon be used on General Electric induction motors of 100 to 3,000 hp rating, according to the company's Medium Induction Motor Dept. Known as Polyex, it is a combination of Du Pont's Mylar polyester films and Dacron tape, and a synthetic hydrocarbon resin, combined into a homogeneous insulating structure. According to GE engineers, it is the first insulation composed of materials that are natural insulators themselves.

The new class A insulation is claimed to have 50% longer life, 50% greater dielectric strength, and 600% greater mechanical strength as compared to conventional systems. Salt-water immersion tests show double resistance to contamination. Heat aging tests show increased mechanical and dielectric strength.

Because of the more homogeneous character, coil power factor of Polyex insulated coils is reportedly substantially lower.

Nelson Electric Plans New Plant in Tulsa

Nelson Electric Mfg Co, Tulsa, Okla., is planning the construction of a new plant at 41st and Sheridan Road, Tulsa, in 1955. Proposed construction includes a manufacturing plant, foundry, office, and cafeteria buildings. At the new location the company owns 57 acres, but only 20 acres will be utilized in the construction.

Present plant facilities at 217 North Detroit Ave, Tulsa, will be vacated when the new building is completed, according to Hans A. Norberg, vice president and general manager. Some of the company's products are instrument, control, and lighting panels, switchgear and high-voltage motor starters, circuit breakers, and junction boxes in water-tight enclosures.

AC Gets Alaska Order

Allis-Chalmers Manufacturing Co has received a $116,164 contract from Petersburg, Alaska, for hydraulic turbine, water wheel generator, switchgear, and automatic controls for a 2,000-kva hydro plant. Designed by R. W. Beck and Associates, Seattle, the plant will use water from the Crystal Lake watershed. Supervisory control equipment in the dispatcher's office 17 mi from the powerhouse will start, stop, and remotely control the plant, scheduled for operation in November, 1955.

MANUFACTURING BRIEFS

American Machine & Foundry Co has elected as vice-chairman of the Board of Directors, General Walter Bedell Smith who retired as Under Secretary of State on October 1. Morehead Paterson, chairman and president, said that Gen. Smith would play a key policy-making role in the company.

Joseph T. Ryerson & Son, Inc's Philadelphia plant has received a Presidential Citation for its efforts in providing equal opportunity in employment to physically handicapped workers.

General Motors will construct an isotope laboratory at the GM Technical Center north of Detroit, and plans to use radioactive isotopes in peacetime engineering and research studies. Work will mainly be confined to tracer studies at the laboratory.

Line Material Co has extended simplified catalog numbers to cover lightning arresters and arrester-cutout combinations. For example, the "AV1A3" is an "Arrester, Valve" covered by engineering drawing "AV1A" and rated 3 kv. Catalog LA2 (8-54) reflects the change.

Taller & Cooper, Inc. of Brooklyn, N. Y., manufacturer of scientific equipment, has affiliated with Panellit, Inc. of Skokie, Ill., manufacturer of process control, data-reduction and information systems. The announcement was made by Benjamin Cooper and Albert F. Sperry, presidents of the respective companies.

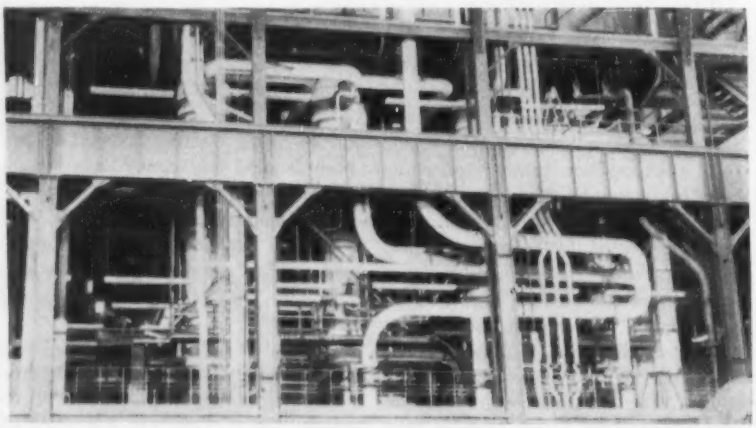
Ajax Electrothermic Corp, Trenton, N. J., has added a new air-conditioned building, representing 50% physical expansion of the engineering and administrative departments, and reflecting the growth of the induction heating and melting field.

Erico Products, Inc. of Cleveland 3, Ohio, announces a custom-molding service for the production of glass fiber reinforced plastic parts. Catalog P-101 lists three compounds having respective properties as follows: Sp. gr. 1.5, 1.9, 1.7; tensile strength 18,000 psi, 10,000 psi, 7,000 psi; dielectric strength vpm, 396, 390, 300; and arc resistance, 120 sec, 120 sec, 100 sec.

Transistorized pocket radio measuring 3 x 5 x 1¼ in. has been put into production by Regency, a division of Industrial Development Engineering Associates, Inc, Indianapolis, Ind. Using 4 transistors, the radio weighs 12 oz.

Hobart Brothers scientific research div at Troy, Ohio, has built a 250-amp dc arc welder using a gas turbine as prime mover. The unit was built to study the gas turbine and the possibilities it may hold for use in building more compact, lighter-weight equipment.

ThermoRay Corp, manufacturer of radiant electric wall heaters, has moved into larger quarters on South Buckhout St, Irvington-on-Hudson, N. Y. Sales and executive offices formerly in New York City are consolidated at the new location.



Piping—250,000 Ft Make A Plant

This maze of pipe is part of the power piping system installed in Georgia Power Co's new Plant Hammond at Rome, Ga. The picture shows extraction heaters, boiler feed lines, and minimum flow lines.

Plant Hammond is designed for three 100,000-kw steam-electric turbine-generators. First unit went in operation in June, 1954; the second in September, 1954; and the third is scheduled for operation in the Summer, 1955.

The power piping handles steam at up to 2,000 psi and at temperatures up to 1,000 F from three boilers rated 750,000 lb per hr of steam.

A total of 250,000 ft of pipe was supplied and erected by Blaw-Knox Co of Pittsburgh, Pa. More than 50,000 ft of power piping ranging from 2 in. to 24 in. nominal sizes was shipped for this installation. In addition, 200,000 ft of piping of 2 in. to ¼ in. nominal sizes was field fabricated on the site. Half of this is copper tubing used on control room instrumentation.

Blaw-Knox is also fabricating piping for the Colbert TVA generating plant being built near Tuscumbia, Ala. Some 419 ft of 19½ OD x 3-in. wall chrome moly steel pipe will carry the main steam. The plant will have four 200,000-kw capability reheat-type turbogenerators, powered by four boilers each rated at 1,280,000 lb/hr. The forged pipe is bored with tolerances of plus 0.000 and minus 0.0625 in. The wall tolerance is plus 0.125 and minus 0.000 in. The alloy pipe is worked (bent) at temperature between 1,750 and 1,950 F.

reduce premium on clearance

Space deadends as close as you wish and always have room left over for easy conductor clamping when you use O-B Strateline Clamps! Acknowledging that phase clearances are frequently close in distribution construction, O-B designers produced a clamp of more than adequate holding strength in an extremely narrow shape. Thus there is always room to work the clamp easily and safely; tape is readily applied if needed; and insulating sleeves for hot line work attach in a simple manner.

Cast in aluminum, bronze, or malleable iron, Strateline Clamps match the conductor; thus avoid electrolytic corrosion and weakening of the clamp purchase after prolonged use. With increasing use of aluminum feeder, this clamp finds special popularity as it accommodates diameters as great as 1.55 inches.

Thus wherever clearance is a factor in construction planning, you can choose O-B Stratelines with the assurance of ample work space, and of complete adaptability to your construction method. See the complete Strateline group on page 70 of your O-B No. 28 catalog!

Ohio Brass

MANSFIELD (B) **OHIO, U.S.A.**

IN CANADA, CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

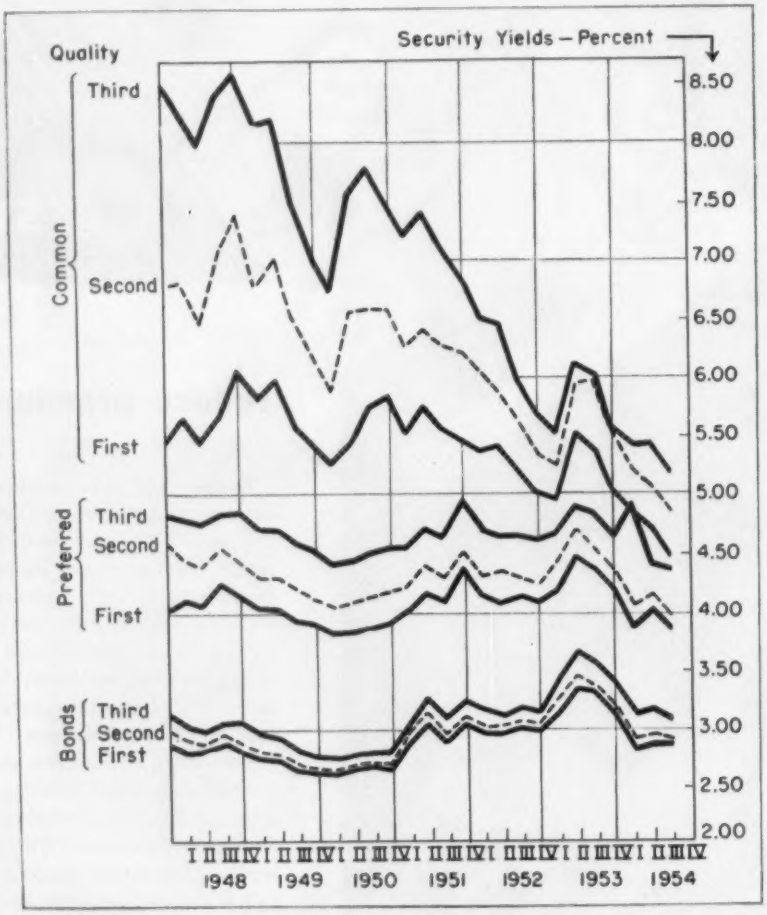
4453-H

Financing Continues at a Record High

Investors continue their record buying of securities offered by electric companies. Third quarter security sales totalled $423 million as compared with $324 million sold in the third quarter last year. Nine months' sales shot up to $1,843,000,000 in 1954 versus $1,353,000,000 recorded during the same period in 1953. These figures relate to securities offered to the public. The reason for the substantial increase this year over last is to be found in the number of refunding and exchange offers made for the purpose of scaling down interest and preferred dividend requirements.

Looking at the nine months' figures shown in the table, securities sold to finance construction totalled $1,394,000,000 in 1954 against $1,342,000,000 in 1953. But these figures do not tell the whole story. So-called "private placements" (bond and preferred stock issues) placed directly with institutional investors should be added to the totals to get a complete picture. When this is done, it will be found that somewhat more money for new construction was raised from investors in 1953. The totals for the nine months this year become $1,520,000,000, slightly below the $1,553,000,000 recorded in 1953. These figures exclude the debt issues delivered by the Electric Energy, Inc, and the Ohio Valley Electric Corp under contracts previously drawn up.

FRB Maintains Buoyancy . . . The Federal Reserve Board's monetary policy continues to maintain buoyancy in the prices of those securities representing high grade investments. This policy has enabled banks to absorb large amounts of short-term Treasury securities with the effect of increasing bank deposits and thus the supply of money. At the same time the Treasury has not offered long term bonds, following the initial sale of 30-year bonds in May 1953. Personal savings remain at all-time record levels. Estimates made by the U. S. Department of Commerce indicate that savings have been at the $20 billion level since early 1953. In 1950, for instance, the comparable figure was $12 billion



SECURITY YIELDS for all quality of bonds, preferred, and common stocks went down for the third quarter of 1954 with the largest decline being in third quality common stocks

Public Offering—Electric Utility Securities
(Thousands of Dollars)

	Nine Months of 1954			Nine Months of 1953		
	New Money	Other	Total	New Money	Other	Total
Bonds, Notes, and Debentures	864,455	300,595	1,165,050	748,700	2,000	750,700
Preferred Stock	194,388	146,975(b)	341,363	143,799	6,835	150,634
Common Stocks (a)	334,824	2,006	336,830	449,738	2,237(c)	451,975
Total	**1,393,667**	**449,576**	**1,843,243**	**1,342,237**	**11,072**	**1,353,309**
	Third Quarter of 1954			**Third Quarter of 1953**		
Bonds, Notes, and Debentures	169,951	79,749	249,700	205,500	.....	205,500
Preferred Stock	27,103	76,671	103,774	2,000	.....	2,000
Common Stocks (a)	67,142	2,006	69,148	114,217	2,237	116,454
Total	**264,196**	**158,426**	**422,622**	**321,717**	**2,237**	**323,954**

Source: Reis & Chandler, Inc.
Notes—Bonds are taken at principal amount and stocks at the price to the public. (a) Offerings to stockholders under subscription rights are included in same quarter as the date of stock record; (b) Includes redemption premium if total amount required does not exceed amount received from new offering. Par, or stated value of securities retired is $142,883,000, and (c) Does not include holding company sales made on Stock Exchanges, public offerings of stock owned by individuals, and sales of stock acquired in exchange for stock of another company.

while in 1929 it was slightly above $4 billion.

Funds in the hands of insurance companies are substantial and borrowers are in a better bargaining position than during last year's comparative money tightness. Pension funds, having no direct access to the mortgage market where investment returns are higher, are also heavy buyers of bonds. These lenders are clamoring for a change in Federal fiscal policies. If the present business expansion is real, a change in policy can be expected which would at least prevent yields from declining further and may push them up.

Prime Borrowers Happy . . . Prime borrowers are generally happy over conditions in the financial markets as they exist this year. A few new bond issues of electric companies, rated Aaa were sold on a yield basis below 3%, a level under which few big investors like to go. Aa rated bonds went out at a price yield not much more than 3%.

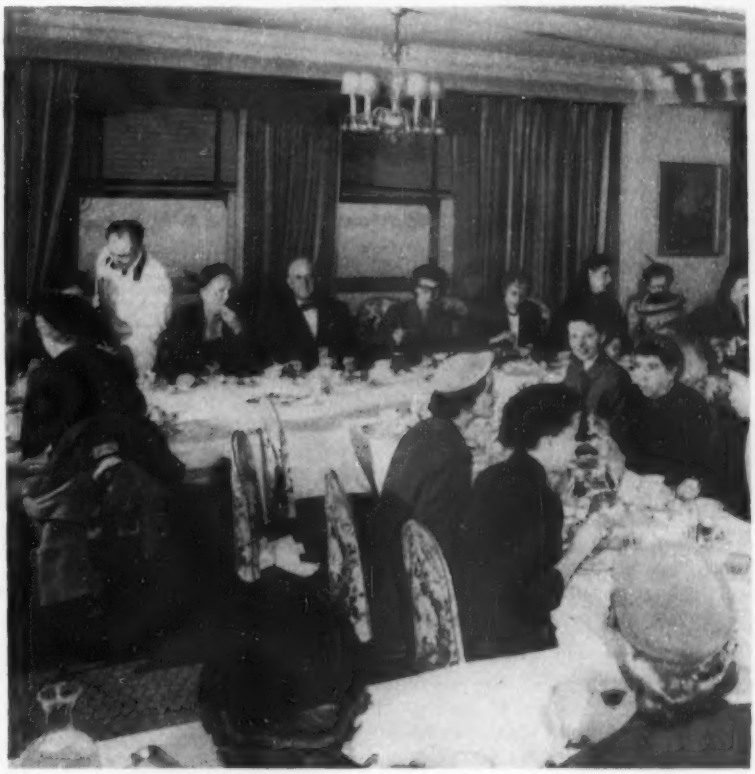
The contrast with last year's high money rates was evidenced in the financing consummated by Consolidated Gas Electric Light & Power of Baltimore. The mortgage bonds of this company carry Moody's Aaa rating. In July an issue of $40 million 3% 35-year mortgage bonds were sold to underwriters who offered them at a price to yield 2.97%. Reception was very good. Last year underwriters had to put a price tag on new bonds of this company which provided a 3.75% yield. Proceeds from this year's sale were used in part to refund the bonds sold last year which carried a 3⅞% coupon.

Preferred Stock . . . During the third quarter of this year some good sized issues of preferred stock were sold for the purpose of shaving dividend payments. In refunding operations electric companies usually take the proceeds received from the new preferred issue and redeem the higher dividend issue at the call price.

However, Georgia Power Co chose an alternative method to retire its $6 preferred stock. Since 70% of the stockholders owning 70% of the outstanding 433,869 shares of this stock resided in Georgia and the company was anxious to retain these people as stockholders, an exchange offer was decided upon. The size of the issue was another consideration, as well as the call price of $110. First Boston Corp, Merrill Lynch, Pierce, Fenner & Beane, Union Securities Corp and Equitable Securities Corp were selected to head a group of investment houses to solicit acceptances from the $6 holders and to purchase new shares not required to effect exchanges. As owners of nearly 95% of the old shares were willing to accept the exchange, few shares remained for the underwriters.

The new preferred carried a $4.60 dividend and holders of the $6 shares were offered one new share plus $5.13-2/3 in cash for each share they owned. The new stock sold immediately at a slight premium above $105—the price underwriters agreed to purchase shares not required for the exchange. This was the principal reason the offer was successful. The remaining unexchanged shares were redeemed on Nov. 6. This was the largest transaction of its kind since Southern California Edison Co retired 6% and 5½% preferred stock in 1947.

Common Stock . . . Utility common stocks scored new gains during the third quarter of the year and on Aug. 20 reached the highest level since 1931. Industrial and railroad stock prices also established high records, as



Southwestern PS Host to Women Analysts

Southwestern Public Service Co chalked up another "first" when it played host at a luncheon for women in finance early this month at the Lawyers' Club, New York. Attending the luncheon were about 50 women who are members of the Women's Bond Club of New York, New York Society of Security Analysts, registered representatives from a number of brokerage houses and staff members of national magazines and newspapers.

Herbert L. Nichols, chairman of the Texas utility who is shown at head table, told the group that about 52½% of Southwestern PS' stockholders were women. He also said that the company's earnings per share, including tax savings due to accelerated amortization, amounted to $1.79 for the 12 months ended Sept. 30, 1954, compared with $1.66 for similar period ended Sept. 30, 1953.

measured by the Dow-Jones averages. Despite this electric companies are not selling common stock issues to the extent they did last year.

Heavy recent offerings of common stock have held down earnings per common share. For instance, the 12 months ended Aug. 31, 1954 income available for common stock as shown by the Federal Power Commission increased 8% over the like period in 1953. However, for the 12 months ended Sept. 30, 1954, a compilation, prepared by Reis & Chandler, shows that on an earnings per share basis the increase was only 2½% over the same period of 1953. This figure is based on the number of shares outstanding at the end of each period and covers 76 electric companies whose September income statements were available at this writing.

Out of some 133 electric companies reviewed, there were 27 dividend increases during the first nine months of this year compared with 42 dividend increases last year.

The spread between the average yield obtainable on the highest quality group of bonds and common stocks, as measured by the Reis & Chandler index, was narrower in August of this year than at any other time since 1946.

FINANCIAL BRIEFS

Union Electric Power Co has purchased the distribution system of the Wever Electric Co. Wever Electric is located nine miles northwest of Ft Madison, Iowa, and serves customers in the town of Wever and the surrounding area.

Arkansas-Missouri Power Co will pay Dec. 15 a quarterly common stock dividend of 28¢ a share and a stock dividend of 8%.

Kentucky Utilities Co will pay Dec. 15 a quarterly common stock dividend of 30¢ a share as compared with 28¢ a share previously.

Atlantic City Electric Co will issue future earnings statements quarterly instead of monthly . . . **Colorado Central Power Co** has scheduled $1.2 million for construction in 1955 as compared with expenditures of around $1.6 million in 1954.

Today in Utility Finance

YIELDS (%)

Quality	Bonds 1st	Bonds 2nd	Bonds 3rd	Preferred Stocks 1st	Preferred Stocks 2nd	Preferred Stocks 3rd	Common Stocks 1st	Common Stocks 2nd	Common Stocks 3rd
DATE									
Nov. 11	**2.87**	**2.92**	**3.10**	**3.95**	**4.03**	**4.36**	**4.52**	**4.80**	**5.19**
Nov. 4	2.87	2.91	3.11	3.87	4.00	4.36	4.57	4.86	5.25
END OF QTR.									
3rd 1954	2.88	2.90	3.10	3.89	3.99	4.38	4.50	4.80	5.19
2nd 1954	2.90	2.96	3.19	4.03	4.14	4.48	4.72	5.04	5.45
1st 1954	2.82	2.87	3.14	3.88	4.09	4.42	4.83	5.19	5.42
4th 1953	3.07	3.12	3.34	4.17	4.32	4.62	5.07	5.57	5.51

Data: Reis & Chandler, Inc.

EARNINGS

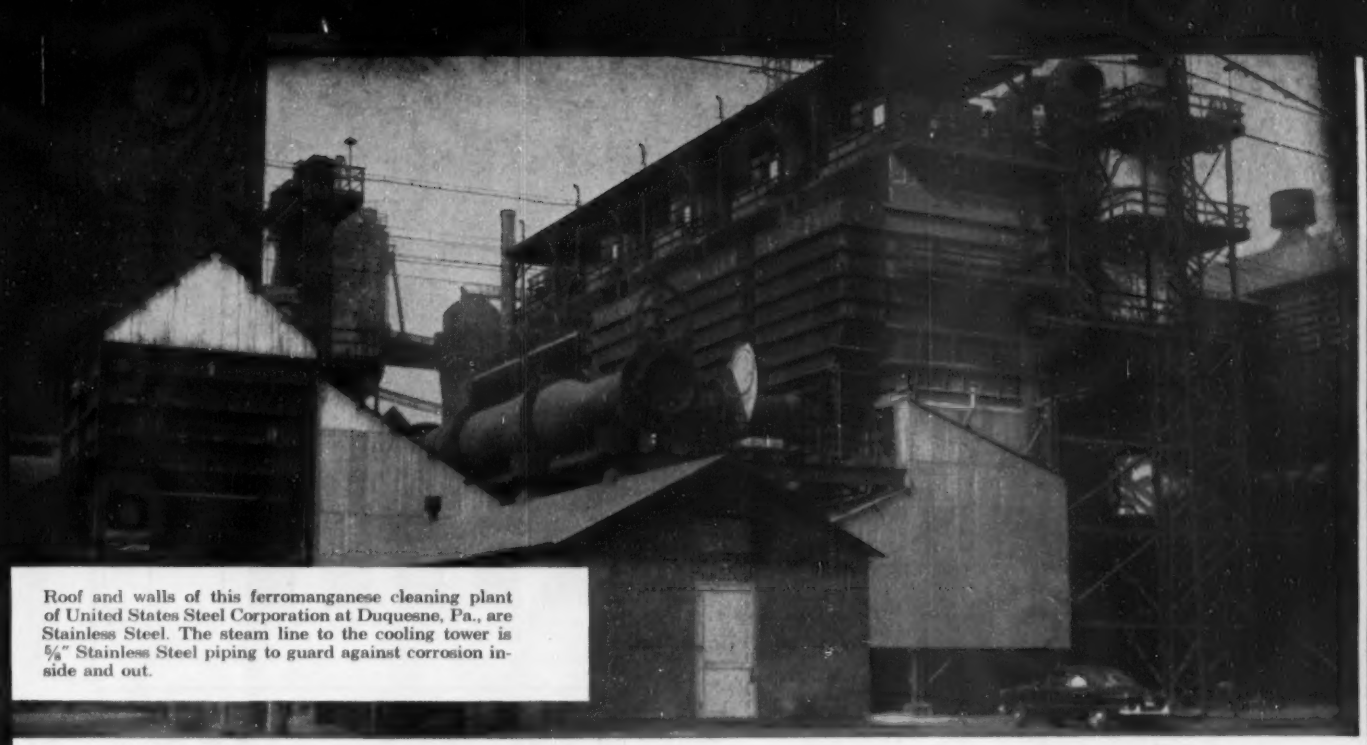
	Period Months Ended		Net Income 1954	Net Income 1953	Earnings Per Common Share 1954	Earnings Per Common Share 1953
Central Illinois Public Service	12	Sept.	$7,077,560	$5,717,351	$1.83	$1.40
Duquesne Light	12	Sept	16,004,696	15,095,658	2.29(a)	2.18
Idaho Power	12	Sept	4,734,796	4,541,948	3.54	3.39
Montana-Dakota Utilities	12	Sept	2,828,427	2,078,937	.....	.....
Pennsylvania Water & Power	9	Sept	1,001,813	980,706	1.75	1.70
Public Service Co of Indiana	12	Sept	12,108,171	11,482,430	2.35(b)	2.32(b)
Puget Sound Power & Light	12	Sept	4,215,677	3,702,404	1.94	1.70
Rockland Light & Power	8	Aug	1,241,169	888,453	0.63	0.43
Southern California Edison	12	Sept	25,292,848	21,895,574	2.78	2.57
Tampa Electric	12	Sept	2,774,017	2,628,378	3.88	3.66
Texas Electric Service	12	Sept	10,074,410	8,822,550	.....	.....
Toledo Edison	12	Sept	5,678,646	5,243,909	1.00	0.91
Utah Power & Light and subsidiary	12	Sept	5,415,432	5,055,986	2.65	2.56
Western Light & Telephone	12	Sept	1,207,166	1,229,614	2.29(c)	2.55(c)
West Penn Electric, consolidated	12	Sept	15,421,140	14,504,671	3.65	3.43
Wisconsin Public Service	12	Sept	4,462,000	4,348,000	1.54(f)	1.65(f)

Notes—(a) Due to change from monthly to quarterly meter reading, earnings in 1954 reflect higher residential readings equivalent to about 3¢ per common share in the second quarter. This excess will be equalized in the course of the readings during the last three months of this year; (b) Based on 4,251,060 shares in 1954 and 4,253,069 shares in 1953; (c) Based on 393,463 shares in 1954 and 391,778 shares in 1953, and (f) Based on average shares outstanding.

FINANCING

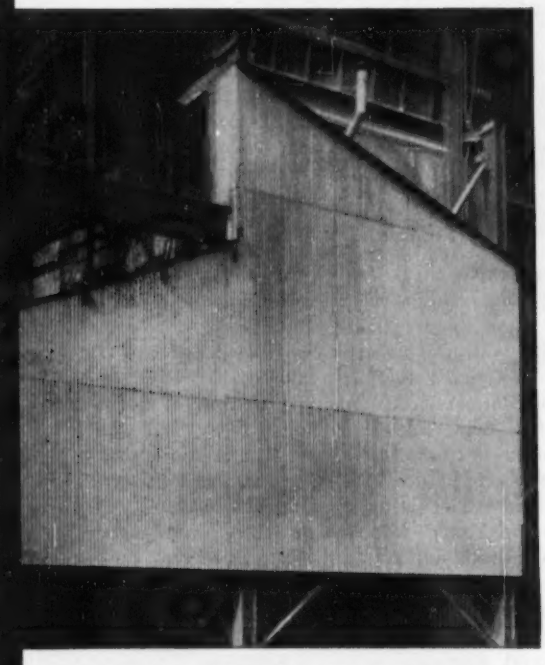
Company and Description	Amount of Offering (000)	Offering Price	Yield to Public
WEEK OF NOVEMBER 11-17			
None			
SCHEDULE FOR NOVEMBER—DECEMBER—JANUARY			
Bonds and Debentures			**Bid Date**
Public Service Co of New Hampshire—1st mtg due 1984	$12,000	.....	Nov. 30
Long Island Lighting—1st mtg due 1984	15,000	.....	Dec. 7
New Orleans Public Service—1st mtg due 1984	6,000	.....	Dec. 14
Commonwealth Edison—conv debs	50,000*	.....	Jan. 11
Preferred Stock			
Black Hills Power & Light—9,950 sh 4.75% $100 par cum	$995	.....	(a)
Black Hills Power & Light—39,900 sh $25 par	998	.....	Nov. 23 (b)
Interstate Power—200,000 sh $50 par	10,000	.....	Nov. 30
Mississippi Power & Light—44,476 sh $100 par (to be offered in exchange for outstanding $6 pfd on a sh-for-sh basis, plus a cash difference between initial public offering price of new shares and redemption of the old shares)	.....	.....	.....
Central Power & Light—75,000 sh $100 par	7,500	.....	Dec. 7
Patchogue Electric Light—750 sh $1,000 par	750	.....	.....
Common Stock			
Virginia Electric & Power—600,020 sh (to be offered commonholders on 1-for-10 basis, record Nov. 23 to expire Dec. 8 with an over subscription privilege)	.....	.....	Nov. 23
ISSUES RECENTLY POSTPONED			
Bonds			
Gulf States Utilities—1st mtg due 1984	$24,000	.....	.....
Consolidated Edison Co of N. Y.—1st mtg due 1984	50,000	.....	.....
Preferred Stock			
Gulf States Utilities—160,000 sh $100 par cum	$16,000	.....	.....
UNSCHEDULED AND/OR UNDER CONSIDERATION			
Bonds			
Connecticut Light & Power—1st mtg	$10,000	.....	.....
Kentucky Utilities—1st mtg	15,000	.....	.....
Duke Power—1st mtg due 1975	40,000	.....	.....
Virginia Electric & Power—1st mtg	20,000*	.....	.....
Preferred Stock			
Public Service Co of Oklahoma—100,000 sh $100 par	$10,000	.....	.....
Southwestern Gas & Electric	6,000	.....	.....
Common Stock			
Kentucky Utilities—about 228,678 sh (to be offered commonholders on about 1-for-10 basis)	.....	.....	.....
Duke Power—218,737 sh (to be offered commonholders on 1-for-20 basis without underwriting)	.....	.....	.....

Notes—* Estimated. (a) To be sold privately, and (b) Dillon, Read & Co, Inc, group underwriters.



Roof and walls of this ferromanganese cleaning plant of United States Steel Corporation at Duquesne, Pa., are Stainless Steel. The steam line to the cooling tower is 5/8" Stainless Steel piping to guard against corrosion inside and out.

Built for *maximum* resistance to gases, dirt and moisture with STAINLESS STEEL roof and walls



A closer view of the wall of the plant shows how the 24-gage corrugated Stainless Steel siding is applied.

By the very nature of its purpose, this building is going to take a beating. It houses a battery of electrostatic precipitators to clean gas from ferromanganese blast furnaces at Duquesne Works of United States Steel Corporation.

Ferromanganese cleaning involves much corrosive dust and fumes, in addition to the moisture and dirt generally found in industrial atmospheres. To give the building maximum life, it was constructed with a roof and walls of U·S·S Stainless Steel.

The Stainless Steel was used in the form of 24-gage corrugated sheets. Fastening hardware and flashing are Stainless Steel too.

In addition to their superior corrosion resistance, Stainless Steel walls and roofs offer many other advantages in industrial buildings. Erection is fast and goes forward in all kinds of weather. Maintenance is at a minimum with no painting required. And, of course, the life of the building is extremely long.

Give your buildings—warehouses, power plants, manufacturing facilities and even office structures—this long, maintenance-free life by specifying U·S·S Stainless Steel. If you would like more information on this type of construction, mail the coupon below.

United States Steel Corporation
Room 4563, 525 William Penn Place
Pittsburgh 30, Pa.

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Name ..... Title .....

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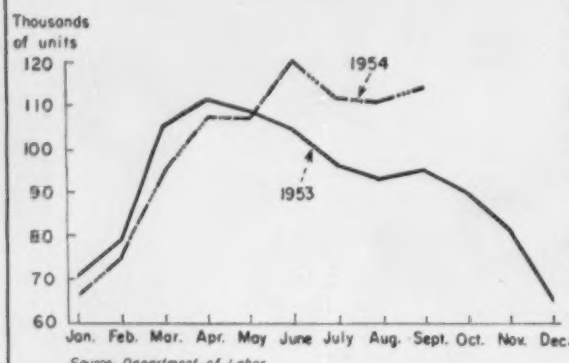
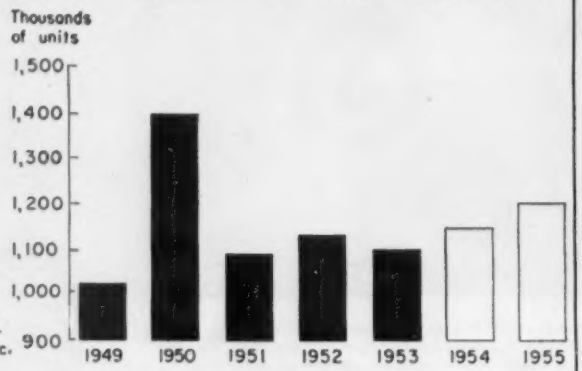
UNITED STATES STEEL

Rise in housing starts shows . . .



Source: Department of Labor

New strength in the home-building boom



Source: Department of Labor; McGraw-Hill Department of Economics

Latest Spurt in Housing To Carry into 1955

The boom in homebuilding is back in high gear, after a year of uncertainty (see charts). It's now clear that 1954 will rank as the second biggest year in the history of United States residential building. And it would take a man of strong conviction and stronger nerves to bet that 1955 won't be even better.

Builders will start well over 1,150,000 nonfarm housing units this year, about 50,000 more than in 1953. Completions won't run quite so high, because a big share of the starts came toward the end of the year. But completions will run at about the level in 1952 and 1953—1.1 million —which is certainly good.

As for 1955, it may be one of the years that nobody estimates correctly. Most of the estimates for housing starts next year seem to be in the 1.1-1.2 million range. But the year seems very likely to start off at a higher rate than this. Right now, 1.2 million starts looks more like a minimum for 1955 than anything else, with the all-time record of 1.4 million starts in 1950 not out of reach.

New Housing Act Spurs Boom . . . Four main signs point to a super-fast start in homebuilding in 1955.

1. The economic uptrend. There's still no sign that the economy as a whole is going to have another boom like the one during the Korean War. But things are picking up in many industries—like autos, steel, textiles—that have been having troubles.

2. The trend in housing starts. Monthly starts ran at least 15,000 ahead of the year-ago month in July-October. And the margin has been getting bigger with each passing month.

3. FHA mortgage applications. They have been running at the highest levels on record. Applications for FHA approvals were twice as high in October, 1954, as in October, 1953, and a new record for the month. August and September also set records for those months.

4. Contract reports. F. W. Dodge reported $851.8 million in new residential building contracts in 37 eastern states in October. This is not only a record for October—it is a record for any month in the long history of the Dodge reports.

Momentum Will Carry Into 1955 . . . The fact that things are going so well now does not, naturally, guarantee that they will stay that way forever. But it does seem clear that the housing boom has generated enough steam to carry well into 1955 at a near record or record rate. And that does just about guarantee a very high total of home completions for the year.

How long will the boom go on? In the present climate in the homebuilding industry, it's hard to reach a rational judgment. But it still seems likely that the level of new housing starts will have to come down again before too long. These factors are still acting as drags.

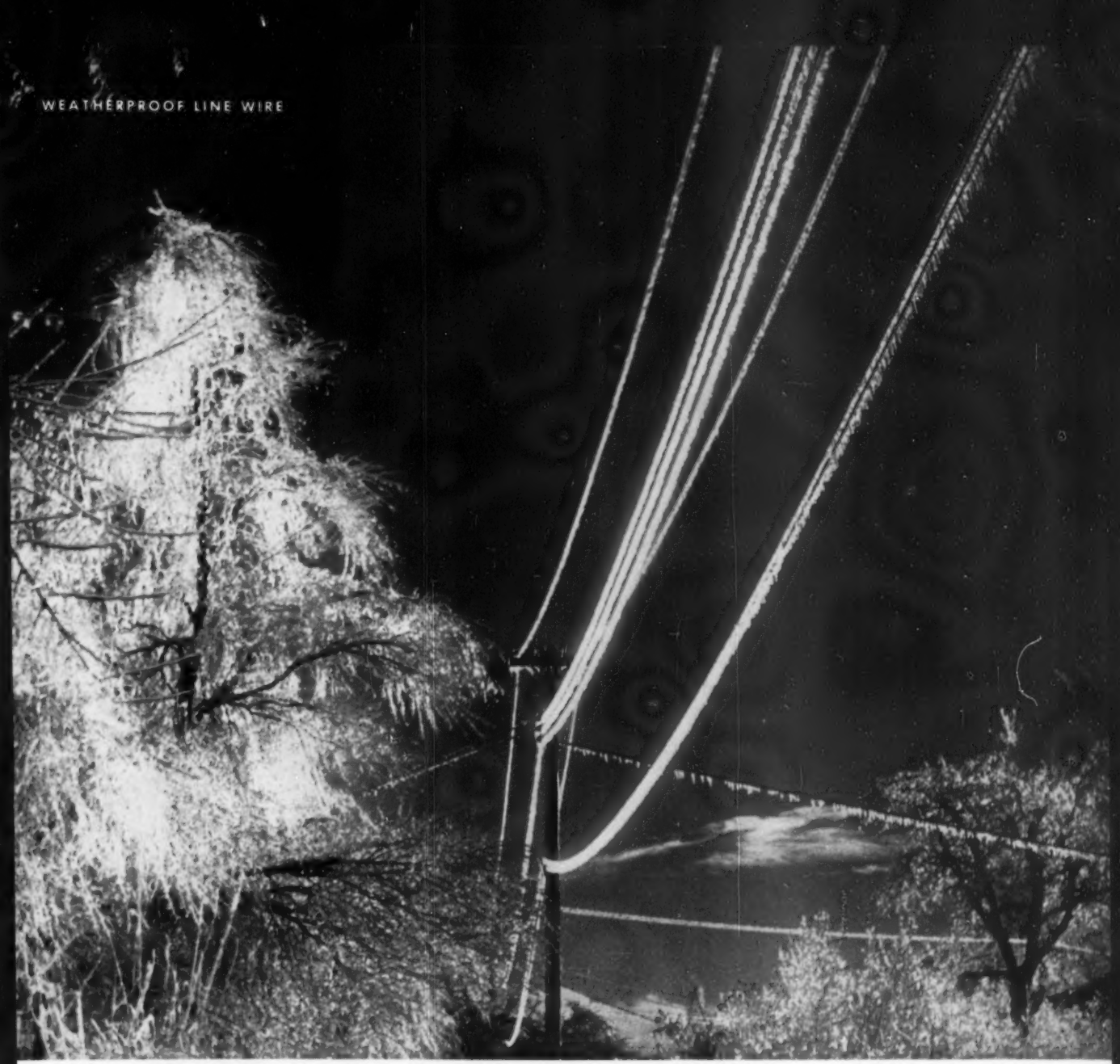
1. Household formation, the major ingredient of housing demand, is down below one million today, and will probably fall lower in the late 1950's. The reason is that fewer children were born in the 1930's, so there are fewer today to get married or set up separate households.

2. Vacancies are rising. Although no really good figures are available, indications are that vacancies are up substantially in the past couple of years. And that will eat into demand for new housing eventually.

3. Finally, the prices of older houses are still falling. And this trend could, eventually, make it tougher for a family to sell their old house in order to buy a new one. The loss they would take might be too great.

These factors, plus the inherent risks in the super-easy financing of today's homes, are likely to take the bloom off the housing boom—eventually—at least for a few years. But there's no doubt that, at the present, the trend is all in the other direction.

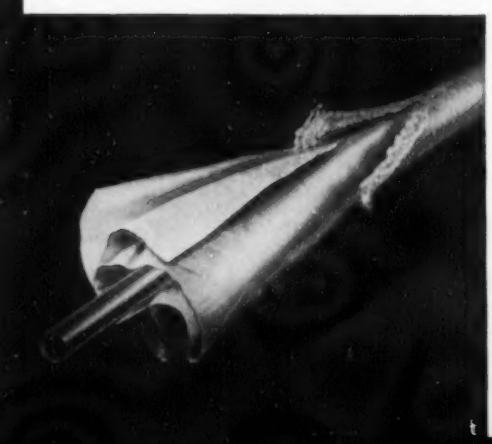
WEATHERPROOF LINE WIRE



SLEET AND SNOW severely test line wire. In foul weather or fair, DURALINE provides greatest service dependability.

Here's how Anaconda's Duraline protects circuits

It cuts down outages and interferences in rain, snow and sleet



DURALINE* is completely unlike any other weatherproof line wire. It gives the *finest* weatherproofing and has longer life.

Note its continuous sheath of interlocked and felted, fibrous material—thoroughly impregnated with URC saturants and finished with URC finishers. Only Anaconda makes a line wire with this type protection.

As a result, Duraline reduces grounds and shorts in wet, windy and icy weather. It protects against contact with foreign objects. It eliminates festooning.

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Curvacore DESIGN EXTENDED TO 500 kva

NOW a complete line of smaller, lighter, single-phase distribution transformers

NOW THE IMPORTANT ADVANTAGES of *Curvacore* design come to you on larger Allis-Chalmers distribution transformers as well as on the smaller units. You get the benefits of low exciting current, low losses, good regulation, and reduced dimensions and weight on transformers up to 500 kva, 15 kv and below. A-4488

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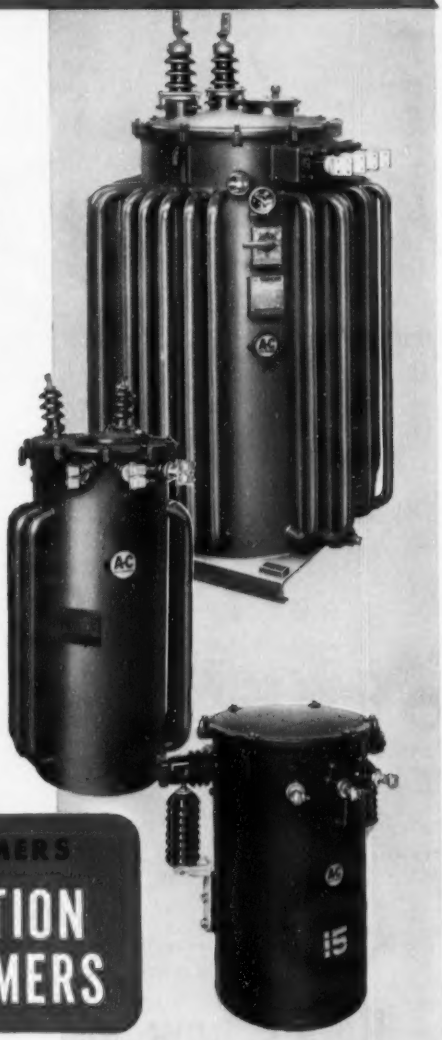
As much as 20% savings in weight have been effected by the application of *Curvacore* design to the larger sizes. Handling is easier, installation takes less time. More capacity can be installed on a pole.

In addition to the highly efficient electrical assembly that *Curvacore* design makes possible, you get a sealed transformer with retained Corprene gaskets used at all joints. Paint is especially formulated to resist industrial atmosphere, salt spray and climatic conditions.



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Curvacore design permits full utilization of the advantages of cold-rolled oriented steel to permit flux path to follow grain. Photo at left shows how core steel resumes its original shape as it is being laced into windings of an Allis-Chalmers distribution transformer. Result is high permeability, low losses, and a mechanically stronger core structure of less weight than previous designs.

Field Stocks Available
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